

The Iron Age

A Review of the Hardware, Iron and Metal Trades.

Published every Thursday Morning by DAVID WILLIAMS, No. 83 Reade Street, New York.

Vol. XIX: No. 25.

New York, Thursday, June 21, 1877.

\$4.50 a Year, Including Postage.
Single Copies, Ten Cents.

A New Harvester and Binder.

We print herewith an illustration of a new harvester and binder, made by the Walter A. Wood Mowing and Reaping Machine Co., Housic Falls, N. Y. This machine is intended to solve the difficult problem of binding as well as harvesting grain.

The capacity of the machine is stated to be about equal to 30 men. One man with a good team can cut and bind from 15 to 20 acres of grain per day, the amount depending upon the condition of the grain. The binder is a separate machine from the harvester, and can be attached or detached by anyone who has sufficient intelligence to run a harvester. The harvester supplies the grain to the binder by means of an endless apron.

It will be observed by reference to the cut that the grain is carried over the main drive wheel directly in front of the driver into the lap of a well formed platform, where at stated times it is received by mechanical arms and compressed into a compact bundle, the main binder arm performing a double work—compressing and then hoisting the sheaf out of the way of the team when making the next round of the field. The wire used is No. 21 annealed, running about 360 feet to the pound, the average cost of which is more than saved in the clean cut and tidy binding the machine makes over the ordinary hand work. The advantage of wire band over straw is very great, allowing the sheaf to dry quicker and more perfectly. This binder, in ordinary grain, will deliver a bundle every 10 feet, and by means of a foot pressure on the pedal, the driver can size the bundle to the condition of the crop. By an ingenious arrangement the wire is drawn from the spool on which it is wound, and makes the twist and knot as firm and neat as by hand work.

Patent Wrought Iron Shear.

We illustrate upon this page a patent wrought iron shear by Messrs. Brown & Curtis, of Cleveland, Ohio, which has some points worthy of attention. When not in use it occupies a space 6x30 inches; when at work the only additional room needed is space in which to bring down the lever. The weight is 180 lbs. The knives have no holes in them, and can be taken out in three minutes. When necessary they can be renewed at the mere cost of the steel. One set of knives will last for a long time. The shears are guaranteed to cut readily bar iron, 4x½, 6x½, 1½ round, 1½ square. They will also cut plow steel.

A Village of Nail Makers.

Approaching the place unexpectedly soon after dark, especially if one has the advantage of a hill that commands a view of the struggling, narrow streets, the effect is one that is not soon forgotten. It is always dingy and depressing in these villages, which, in a manufacturing sense, "feed" the large Black Country towns. Sulphurous fumes taint the air, and impart to it strange flavors that may be tasted on the lips as the salt of the sea may be tasted miles distant from the coast line. The roads, which in dry weather resemble nothing so much as caked boot blacking, yield puddles and rivulets of ink when it rains—which hereabout it does with charitable frequency. There is "grit" everywhere. On the latches of the doors, on the pages of the local newspaper, on the change taken from the shop tills; it renders raspy the cordial grasp of the hand with which the natives greet a stranger; it makes ash color the fleece of the sheep that in the wayside meadows crop grass that looks as though it had been plentifully seasoned with black pepper. For those who are unused to such a cruel atmosphere there is headache everywhere. The pall-like curtain which the iron interest hangs between earth and sky, as though to conceal from the sight of heaven the degradation to which it condemns thousands of women and little children, never wears away for lack of replenishment. Brisk winds may attempt to blow it to rags, and endeavor to rend and disperse it, but everlastingly there ascend from towering chimney shafts columns of pitch black smoke, seemingly dense as wool, to mend the breaches and increase the bulk. During winter time it is either twilight or dark, and when summer days are longest and the sun most powerful, the nearest approach to daylight, real and unadulterated, is as the garish sheen of a pewter shilling compared with the silver coin, genuine and bright, from the Queen's Mint. In the nail making village, however, no matter how black, the night cannot be called dark.

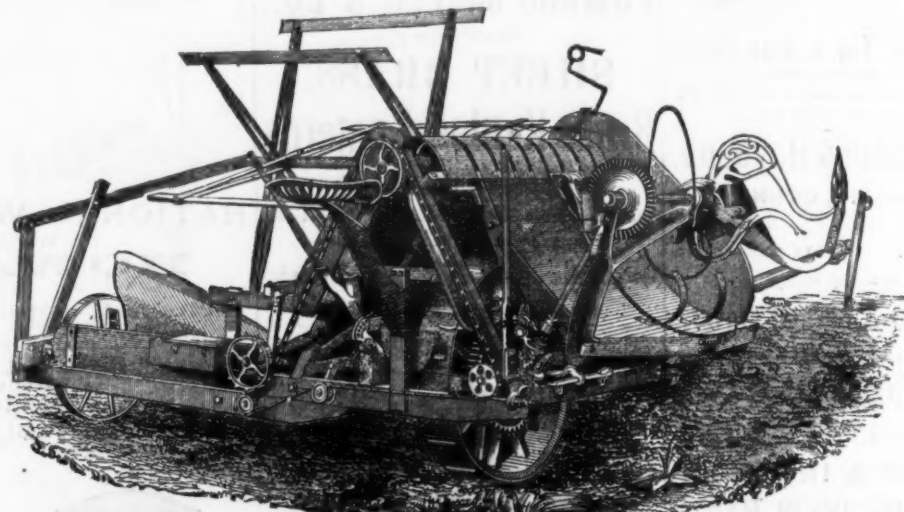
Viewed at a little distance, the sight is one of the strangest. The door of every house stands wide open, and there streams out into the street a stifling glare, sometimes rosy red, sometimes sickly pale, quivering across the narrow roadway, now lengthening so as to reach the wall of the hovel opposite, and again shortening so that it retreats almost to the threshold it issues from. All the way down

the lane from either side the houses send forth this weird illumination, accompanied by a shrill metallic tinkling, as though somewhere in the neighborhood a fairy farriery were busy with a hundred industrious elves banging with tiny hammers on Lilliputian anvils. The sound is as musical as the ringing of bells—a jangled-tangled discord, each bell aware of the shockingly bad time it is keeping, and racing to right itself. "Tang tang! ding dong! tang tang!" and now and again an under current of heavier banging by way of bass. The curious observer, hearing and seeing all this, will naturally feel disposed to inquire further into such goblin business. He approaches so that he may peep in at an open door, and straightway, at all events, his mind is set at rest as regards there being anything afoot in the nature of enchantment, but he does not cease from wondering. They are not creatures of elf land who are stirring the fires and making the anvils ring, neither is the novel effect due to the performance of ordinary blacksmiths.

where there are 6 or 8 children of various ages, the total earnings amount to something considerable. The houses are built for the purpose. To each one is attached a "stall" or "hearth," the separate rent of which is fourpence a week, a mite of a place, occupied chiefly with the hearth and the bellows, and affording so little elbow room for the half dozen workers within that it appears a marvel they are not seared all over the exposed part of their bodies by the flying sparks and red-hot chips. They are what are called free workers, not being engaged to labor on material provided by the master and paid according to results.

Nails of every shape and form appear to be an article of commerce for which the demand seldom slackens, and it is impossible to produce too many of them. The merchant of whom the taller buys his "rod"—the more or less substantial iron wire from which the goods are manufactured—is always willing to receive nails at the fixed price, and in the case of in-

—and at which the half-starved wife and the ragged family must get to work as soon as it is day-light, that nails enough may be carried to the Fogger to cover the cost of bread and tea for the breakfast, with perhaps a few pence over for the male head of the household to amuse himself with in the Fogger skittle ground, while his wife and daughters busy themselves at the forge and anvil to buy more iron, so that a few pounds of nails may be ready for the Fogger by the evening, and a bit of supper procured. It is, however, recorded in favor of married "nailers" as a body, that though they may compel their wives to work for them, they are seldom known to bruise and jump on as well as to starve them. It is questionable, however, if this forbearance is entirely due to generosity. A female, used from her girlhood to the untrammelled use of her arms and the exercise of a weighty hammer, might prove an awkward antagonist if she were sufficiently exasperated—especially assuming that she had two or three vigorous young blacksmith daugh-



COMBINED HARVESTER AND BINDER BY THE WALTER A. WOOD MOWING AND REAPING MACHINE COMPANY.

The operatives, with a few exceptions, are women and children. Nor are these daughters of Vulcan mere make-believe workers. There are matrons—the mothers of the boys and girls that swarm about the hearth and forge (the youngest disporting with "clinkers" for playthings among the warm ashes)—and women old enough to be grandmothers, with hair stunted and gray. Young women, too—unmarried lasses, with colored handkerchiefs bound round their heads, to keep their cherished tresses from smoke and sinning, and with another kerchief in lieu of a bodice, bare armed to the muscular shoulder; and one and all are cheerfully "hard at it," tugging the bellows, attending the forge fire, or facing each other at the anvil, hammer in hand, and with the glowing metal between. Some of these sooty Amazons, by a curious mechanical contrivance, work with two hammers at one and the same time; the one, the heavier, being set going by means of a treadle, and the lighter implement in the hand. They are making nails of all sizes, from the smallest brad to the 6 inch bolt-headed "spike."

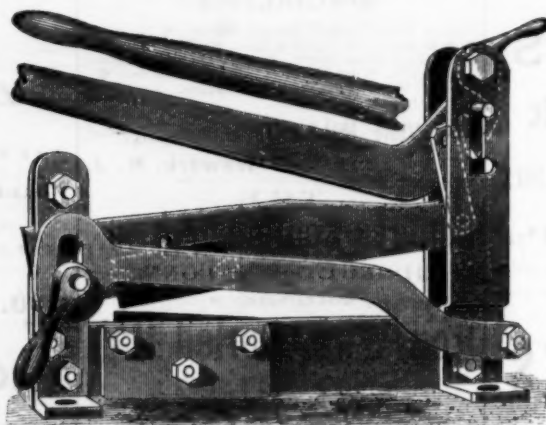
It is a trade as commonly followed by women in certain Black Country regions, including Netherton, Rowley, Lye Waste and Bromsgrove, as the lighter employment of needle work is adopted by the gentler sex in more civilized parts by way of earning a livelihood. The father, as well as his wife and children, is a nail maker, and the reason why he has not figured conspicuously in the above feeble picture of the family forge is that in but too many instances the father "nailer" is not partial to working by artificial light; nor, indeed, by any other if his good lady and their progeny are content to labor for him. Indeed, it would seem that many of these poor women are proud of being able to supply their idle "better-half" with means to cut a figure at the drinking shop and the pigeon flying club. It is terribly hard work and very badly paid. For instance, for making what are called "No. 6 clasp," which weigh 200 to the pound, the pay is twopence a pound—a shilling for 6 pounds; and if found to be as much as an ounce over weight the work is "talled," as it is called, to the extent of a penny in the shilling. A woman must work 12 or 14 hours a day at the forge to earn 7/ a week; and not one in a hundred earns as much as 9/ by her own unaided labor. But the inducement is that a child old enough to crack cherry stones with a hammer can assist at nail making, and "every little helps toward the mickle." More babies can earn 2/ a week, and

dustrious families, once a week may be seen the edifying spectacle of father and mother and a troop of youngsters, ranging in age from 5 to 15, walking in Indian file, and each the bearer of a load of rod iron, thin and thick, to be made up during the ensuing week. But they are not all nail makers who adopt this creditable method of doing business. If it were so, the scandal would probably cease to exist that among the nailers may be found the most ragged, squalid and miserable beings in existence. Not so many years since the Legislature found it necessary to pass stringent laws by way of rescuing the great community of coal miners from the clutches of the "truck man" and the "tommy shop" keeper—unscrupulous

ters ready to espouse her cause.—*The Ironmonger.*

The Vulcan Iron and Nail Works.

The Chattanooga Commercial has the following: The permanent organization of this (the Vulcan) company is as follows: J. C. Hazelton, of the Etina mines, president; F. J. Stone, of the Bartow Iron Works, treasurer and general manager; J. J. Willard, secretary; and Thos. E. Roper, of Rome, Georgia, superintendent. The works are owned by Messrs. Hazelton & Harrison, and run by the Bartow Iron Company. The main building has been roofed anew and thoroughly repaired. It contains 8 puddling furnaces and 5 heating furnaces. One of these, an old rail furnace, has a capacity of heating 50 tons every 24 hours. A train of muck rail and nail plate rolls and a squeaker are run by a 175 horse-power engine, with an enormous fly wheel, 30 feet in diameter. A train of light merchant rolls are run by a 75 horse-power engine, and a 30 horse-power upright engine furnishes power for nail plate shears, rail saws and small guide mill shears. A 25 horse-power engine runs three bolt machines, one pair of shears, two upright drills, three lathes, one planer, one railway axle lathe, one large punch for punching fish plate, and three nut machines, one of which cuts four nuts at a time. A large steam hammer for forging car axles and hammered shapes for bridge and railway



PATENT WROUGHT IRON SHEAR BY MESSRS. BROWN & CURTIS.

work, stands at the right as you enter the building. A 10 horse power pumping engine with a shaft 300 feet long, works a double acting walking beam pump at the river, which raises a 3 inch stream constantly. In the main building are also a battery of five huge steam boilers, which feed the six engines named, and a warehouse for storing merchant iron. The blacksmith shop at the right is roomy and contains 10 forges, run by blast. In this shop are hundreds of patterns for forging a variety of irons for bridge and car works. At the left of the main building will be erected a shop, 66x32 feet, in which punching machines, roller lathes, rail strengthener and an ore crusher will be placed, with an engine of 25 horse power. A nail machine shop, 70x40 feet, will be built just south of the main building and a 75 horse-power engine will run 30 nail machines of the most improved pattern, which the company are making in their shops. To this building will be added another, 33x60 feet, for a cooper shop and nail warehouse, and another battery of boilers for making steam for machinery in the new

work, stands at the right as you enter the building. A 10 horse power pumping engine with a shaft 300 feet long, works a double acting walking beam pump at the river, which raises a 3 inch stream constantly. In the main building are also a battery of five huge steam boilers, which feed the six engines named, and a warehouse for storing merchant iron. The blacksmith shop at the right is roomy and contains 10 forges, run by blast. In this shop are hundreds of patterns for forging a variety of irons for bridge and car works. At the left of the main building will be erected a shop, 66x32 feet, in which punching machines, roller lathes, rail strengthener and an ore crusher will be placed, with an engine of 25 horse power. A nail machine shop, 70x40 feet, will be built just south of the main building and a 75 horse-power engine will run 30 nail machines of the most improved pattern, which the company are making in their shops. To this building will be added another, 33x60 feet, for a cooper shop and nail warehouse, and another battery of boilers for making steam for machinery in the new

buildings. The total capacity of merchant iron and nail plate of these works will be 38 tons per day. Mr. Hazelton informs us they propose to run double turn as soon as they get fairly started, and will push the works to the fullest capacity, at the same time using such economy in fuel, etc., as to allow them a fair margin for manufacturing even at present prices. The works are in the hands of thoroughly competent gentlemen, and we predict a success that will enable them to largely increase their capacity at an early day.

Conservatism of English Manufacturers.

A correspondent of the Sheffield Telegraph, writing from New York under date of the 19th ultimo, says:

Sheffield agents here complain that they are not doing a "rushing" trade in the manufactures of your town. They admit that they are doing better than they have done for some time, and that the improvement in trade gives signs of steadiness and continuance. They still complain that Sheffield manufacturers refuse to adapt themselves to American requirements. I had given to me the other day a very good illustration why the house of Hermann Boker & Co. should take the agency for Heinisch Sons' shears, and thus apparently show their lack of faith in the ability of the English manufacturer to compete with the American. An English lady who has established herself here as a seamstress in considerable business required a certain description of shears, to which she was about to add some specialty in the way of a guard for her particular work. She applied to the representatives of one of your leading Sheffield manufacturers, and he wrote to his principals asking for prices of the article he described. His principals sent him out not only prices but samples. When the lady called to see these samples she expressed her regret that they were so ill adapted to the work as compared with that which had been produced for her by an American manufacturer, and that the price of the English shears was 50 per cent. more than the American. I had an opportunity of comparing the two, and the difference was so obvious that it seemed that nothing but prejudice would prevent the English manufacturer from at once adapting this make of shears to the American pattern. Instead of a clumsy, heavy-weighted pair of shears that would have tired a woman's hand in less than an hour, the American pattern was light, flexible of motion, and admirably adapted for the rapid disposal of work, without being made a burden to the operator. In bankers', paper makers', and tailors' shears the Americans have, by the study of the wants of the trade, succeeded in producing an article that at once commends itself to the purchaser. Against such facts as these where do the repentings about tariff and free trade come in? If both manufacturers stood on a perfect equality, in this instance the American would win. It is the old story that Sheffield is learning with such bitter experience.

Why the Roumanian Railways are Crooked.—The crooked nature of the railway from Galatz westward, parallel with the Danube, is a peculiarity which there is nothing in the surface of the land to account for. A correspondent of *Le Temps* explains that in following out on the map the capricious zigzags which the principal Roumanian railway describes, a circumstance which becomes more complicated in the eyes of the traveler by reason of a number of curves of a utility more than questionable, one asks himself the reason of this extraordinary antipathy for straight lines, which has placed under the cannon of the Turks an important point in the line of communication so valuable, since it would have been both more direct and safer to have one line run ten good leagues distance in the interior. Here is the singular explanation they give, such as it is: The Roumanian railway was undertaken by Strousberg. One of the stipulations of the contract was that there should be a certain subvention per mile, and this was accorded before the line was laid out. The contractor accordingly lengthened his line with curves to the utmost possible extent.

Rhode Island Manufactures.—Statistics show 2109 manufacturing establishments in Rhode Island, with \$50,000,000 aggregate capital, and employing 56,450 hands, who receive annual wages of \$23,707,513. The value of the annual product is \$121,659,875, the raw material for which costs \$76,715,970, so that the profit over wages and cost of material amounts to \$26,236,392, over 50 per cent. of the capital, and an average of \$12,935 to each establishment, though other expenses greatly reduce this margin. The cotton factories number 135, have \$24,084,309 capital, employ 23,574 hands and produce \$38,927,960. There has been a large increase during the past year in the number and production of all the manufactures.

Metals.**ANSONIA
BRASS & COPPER CO.**19 and 21 Cliff Street,
(Adjoining Office of Phelps, Dodge & Co.)

Sheet Brass, Finished Brass, Polished Brass, Brass Bars, Brass Wire, Hayden's Patent Brass Kettles, Brass Tubing, Lamp Burners, Gun Barrels.

Sheet Copper, Planished Copper, Copper Rivets & Burs, Brassers' & Bolt Copper, Brassers' Rivets, Copper Tubing, Copper Bottoms, Copper Wire, Iron Wire, Fence Wire.

A large variety of Wood and Bronze Case Clocks.

Seamless Brass & Copper Pipe.

THE ANSONIA
Corrugated Stove Platform.
SEE PAGE 9.

Phelps, Dodge & Co.,

IMPORTERS OF

TIN PLATE,

Sheet Iron, Copper, Pig Tin, Wire, Zinc, etc.

MANUFACTURERS OF

COPPER and BRASS.

Cliff St., bet. John and Fulton,

NEW YORK.

DICKERSON, VAN DUSEN & CO.,

Importers of

Tin Plate, Pig Tin, Sheet Iron, Copper, Wire, Zinc, etc.

A full assortment of

Iron and Steel Wire

AND

Galvanized "Ferro" Sheet Iron of the Cleveland Rolling Mill Co.'s manufacture, constantly in stock, all of which we can recommend as being superior to any in the market.

29 & 31 Cliff St., cor. Fulton, DICKERSON & CO., Liverpool, NEW YORK.

SCOVILL MFG CO

BRASS, HINGES, WIRE, GERMAN SILVER.

PHOTOGRAPHIC GOODS.

**BUTTONS,
CLOTH AND METAL.**

DEPOTS, 419 & 421 Broome St., N. Y., 112 Federal St., Boston, 47 La Salle St., Chicago.

FACTORIES, Waterbury, Conn., New Haven, Conn., New York City.

**THE NEW HAVEN
COPPER CO.,**

255 Pearl Street, New York.

Manufacturers of and Dealers in

**Braziers' & Sheathing
COPPER.**

Kettle Bottoms, Bolts, Circles, Rivets, Ingot Copper, Spelter, Solder, &c.

**I. S. SPENCER'S SONS,
IRON FOUNDERS
And Manufacturers.**

GUILFORD, CONN. C. SPENCER. G. B. SPENCER.
Superior Lock and other light gray iron castings made to order.

The Wilmot Mfg. Co.,

96 John Street, Bridgeport, Conn., 50 Barclay Street, New York.

Manufacturers of
**KEROSENE BURNERS AND LAMP
TRIMMINGS, Etc.**

We invite your attention to our extensive facilities for manufacturing articles of utility, novelty, or embellishment, and assure you of our ability to meet the requirements of every branch of trade. The increasing demand upon us has made it necessary to extend our works, and we now occupy the entire premises, No. 50 John Street, and our facilities for the production of Light Metallic Goods, in Copper, Brass or other Sheet Metals, are unsurpassed. The use of the most approved machinery and appliances, our long experience and established reputation in this branch of manufacture, encourage us to solicit still more extended relations with those who require work of this class, and we take this method of calling your attention to our establishment.

R. SELLEW & CO.
Dealers in METALS,
Tin Plate, Sheet Iron, Copper, &c.
SAINT LOUIS.

**Metals.****Waterbury Brass Co.**

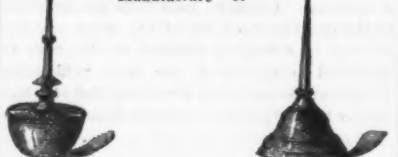
CAPITAL - - \$400,000.

JOHN SHERMAN, Agent,
296 Broadway, - - New York.
Mills at WATERBURY, CONN.

Sheet, Rolled and Platers' Brass,
GERMAN SILVER,
Copper, Brass and German Silver Wire,
BRASS AND COPPER TUBING,
COPPER RIVETS & BURS,
BRASS KETTLES,
WASH BASINS,
Door Rail, Brass Tags & Step Plates,
PERCUSSION CAPS,
POWDER FLASKS,
Metallic Eyelets,
Shot Pouches,
Tape Measures, etc.

Manhattan Brass Co.,

Manufacture of



Oldest. Broughton.
Brass, Copper, Tin & Zinc Oilers
Of every description.
Office, 53 Rensselaer Church St., N. Y.
Works, 1st Ave., 27th to 28th Sts., N. Y.

Holmes, Booth & Haydens,

WATERBURY, CONN.

NEW YORK, BOSTON,
49 Chambers St. 18 Federal St.

Manufacturers of all kinds of

Brass, Copper & German Silver,
ROLLED AND IN SHEETS.

BRASS & COPPER WIRE,

Tubing, Copper Rivets & Burs.

BRASS & IRON

JACK CHAIN, DOOR RAIL.

German Silver Spoons,

SILVER PLATED FORKS & SPOONS,

Kerosene Burners, &c.

JOHN DAVOL & SONS,Agents for
Brooklyn Brass and Copper Co.,
Dealers inIngot Copper, Spelter, Lead, Tin,
Antimony, Solder & Old Metals.

100 John Street, N. Y.

**Bailey, Farrell & Co
BRASS FINISHERS**

and

FOUNDERS.**Brass Work**

FOR

Plumbers, Gas and Steam Fitters.

ENGINE BUILDERS.

Pittsburgh, - - Pa.

New Catalogue packed with first order or mailed on receipt of eight stamps.

BALTIMORE**COPPER WORKS.****POPE, COLE & CO.,**

Are now Purchasing

Copper Ores

and smelting and refining at their works, where, with experienced workmen and unusual facilities, we are turning out Ingot and Cast Copper of unequalled purity and toughness.

We are prepared to buy Ores, Matte, Regulus and other furnace material, in any quantities.

Office, 57 South Gay St., Baltimore Md.
Works at Canton.**PASSAIC ZINC CO.**

Manufacturers of

Pure Spelter

FOR

Cartridge Brass, Gas Fixtures, Bronzes

AND ALL FINE WORK.

Also for

Galvanizers & Brass Founders.
MANNING & SQUIER, Gen'l Agents
113 Liberty Street, N. Y.**Metals.****The Plume & Atwood
Mfg. Company**

MANUFACTURERS OF

SHEET and ROLL BRASS and WIRE,

German Silver and Gilding Metal,

Copper Rivets and Burs,

Kerosene Burners,

Shoe Eyelets, Lamp Trimmings, &c.

80 Chambers Street, New York.

13 Federal Street, Boston.

Rolling Mill, Factories,
THOMASTON, CT. WATERBURY, CT.**Brass Goods
Mfg. Co.,**

280 Pearl St., N. Y., Manufacturers of

Stamped Brass & Silvered GoodsPLATED ROSES, PICTURE NAILS,
THIMBLES, DISKS,
ESCUTCHEONS, BRASS CAPS,
DROP BASES, LABLES.**Patent Mirror Business Cards,**

The only indestructible and most attractive card, specially made for exhibitions, fairs, &c.

Patent Tin Handle Mucilage Caps & Brushes.

Special facilities for manufacturing small articles of new style and design to order.

EDWARD MILLER & CO.,

Manufacturers of

SHEET BRASS,**Brass Kettles, Lanterns**

OILERS, KETTLE EARS,

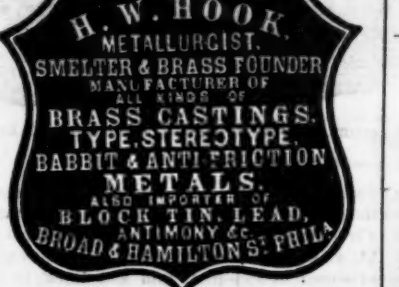
Spouts, Tinmen's Trimmings, Kerosene
Lamps, Burners, Trimmings, &c.

35 Warren Street, New York.

Mill and Factories, Meriden, Conn.

HOOKE SMELTING CO.

SUCCESSORS TO



Railroad and Machinists' Supplies.

New Jersey Wire Mill.**HENRY ROBERTS,**

Manufacturer of

Steel & Iron Wire.**SPECIALTIES:**

Tinned Wire, Tinned Broom, Spring Wire, made from Bessemer Steel; Cast Steel and Iron Cooped Ball Wire; Rivet, Screw, Buckle, Umbrella, Fence, Brush, Gun Screw Wire; Sewing Machine and Machinery Wire. Fine Wire for weaving. Also Wire of any shape made to order.

WIRE MILL, 39 Oliver St.,

Newark, N. J.

Gilbert & Bennett Mfg. Co.,

GEORGETOWN, CONN.,

MANUFACTURERS OF

Iron Wire, Curled Hair

AND GLUE.



Gilbert's Rival Ash Sieve.

UNION METALLIC CLOTHES LINE**WIRE.**

The highest price paid for Cattle's Tails and Hog's Hair.

WAREHOUSE,

273 Pearl Street, New York.

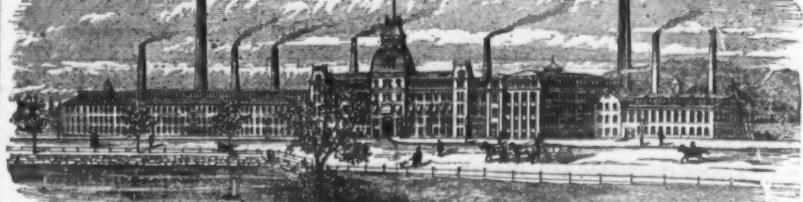
JASPER E. CORNING,Agency for Iron Wire,
And Manufacturer of Wire Goods, Brass Plated and Iron Wire sieves, iron and Brass Wire brushes, Ash sifters, and various descriptions of Wire Work.
No. 55 Cliff Street, N. Y.**Wire, etc.**

PHILIP L. MOEN, President & Treasurer.
CHAS. F. WASHBURN, Vice-President & Secretary.

WASHBURN & MOEN MANUFACTURING CO.

Established 1831.

WORCESTER, MASS.

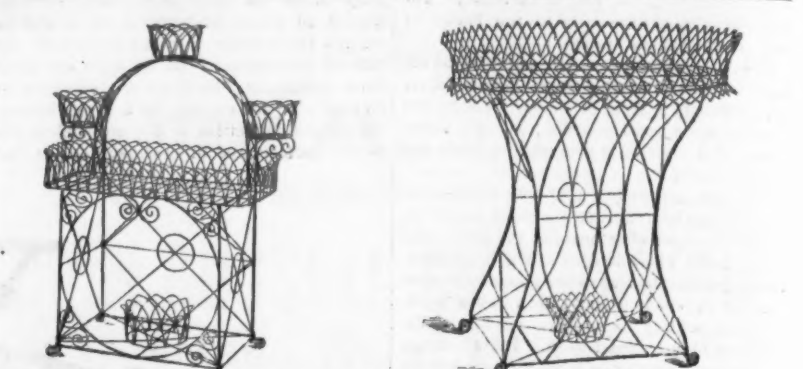


MANUFACTURERS OF

IRON AND STEEL WIRE.

WIRE RODS of all Grades: Round Iron, Rivet quality 5-16 in. to 1/2 in., cut to any length. Owners and exclusive Operators of the PATENT CONTINUOUS ROLLING MILL, producing Iron and Steel WIRE, in coils of 100 pounds without SEAM or WELD. Patent Galvanized Telegraph Wire, Market and Stone Wire, Annealed Fence and Grape Wire in long lengths: Copper Fall-hill Wire: Rope, Bridge, Bolt, Screw, Rivet, Buckle and Chain Wire. Wire for the manufacture of Card Clothing, Heddles, Reeds, &c. Piano-string Covering Wire, Tinned Broom Wire and Tinned-plated Wire of all sizes. A specialty is made of Clock, Machinery, Gun Screw and Spiral Spring Wire, and Tinned Wire to Pattern for particular purposes. From selected stamps of Norway Iron, Any grade of Wire furnished, Annealed, Bright, Polished, Coppered, Galvanized or Tin Plated. Wire furnished, Straightened and Cut to any length. Steel Crinoline Wire, Patent Linen finish. Unrivaled Steel Music Wire. Steel Wire for Springs, Needles and Drills. Market Steel Wire kept in stock, all sizes.

Warehouse, 42 CLIFF STREET, NEW YORK.



NATIONAL WIRE AND LANTERN WORKS,
Warehouse, 45 Fulton Street, New York.

HOWARD & MORSE,

Manufacturers of

Brass, Copper and Iron WIRE CLOTH,

Locomotive Spark Wire Cloth, Iron Wire Bolting Cloth,

Ship and Railroad Lanterns, Signal Lights, Conductor's Lantern

ADJUSTABLE GLOBE HAND LANTERN,

Desk and Office Railing, Riddles, Coal and Sand Screens, Nursery

Fenders and Spark Guards, Ornamental Wire Fence.

I X L FLY TRAPS,

Dish Covers, Wire Cloths, Bird Cages,

Steel Flue & Casting Brushes,

AND

WIRE GOODS.**H. BELMER & CO.,**

CINCINNATI, O.

IRON AND STEEL WIRE ROPE

For Hoisting, Running & Standing Ropes, Ferries, &c.

CONSTANTLY KEPT ON HAND.

Address, HAZARD MFG. CO., Wilkesbarre, Luzerne Co., Pa.

ALBERT A. ARNOLD,

MANUFACTURER OF

Wire Cloths

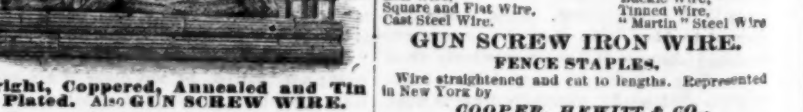
STEEL BRUSHES, AND CASTING BRUSHES.

AND WIRE WORK OF EVERY DESCRIPTION.

Office & Manufactory, 161 Whalley Ave., New Haven, Ct. N. Y. Agency, Patterson Bros., 27 Park Row.

Geo. W. Prentiss & Co.,

HOLYOKE, MASS.,

IRON WIRE.

Bright, Coppered, Annealed and Tin Plated. Also GUN SCREW WIRE.

Of all sizes straightened and cut to order.

ROEBLING'S**WIRE ROPE**

For Best

IRON or STEEL WIRE HOISTING, RUNNING or STANDING ROPES, or BEST GALVANIZED CHARCOAL WIRE ROPES FOR SHIP'S RIGGING.

Address, JNO. A. ROEBLING'S SONS, Manufacturers

Trenton, N. J. or 117 Liberty St., N. Y.

Wheels and Ropes for transmitting power long distances. Send for Circular and Pamphlet.

90 Union Street, Boston.

50,000 feet Clinton Wire Cloth, 100,000 FEET

Black-walnut Screen Molding.

Liberal discount to the trade.

OSCAR W. YOUNG, 60 Fourth St., Under Lyceum Hall, Brooklyn, E. D., N. Y.

**G. Greenleaf & Co.,
WIRE WORKERS.**

Wire Cloths, Foundry Riddles, Coal Screens, Nettings, Sparkar Cloths, Iron Railings, Window Guards, Patent Barrel Coal Sieves, Rat Traps, and every description of Wire Work made to order.

SCROLL SAWS
Centennial Medal
TO
TRUMP BROS.
Wilmington, Del.
Dexter, 8; Westwood, 13 to 15.
Send for Circular and Terms.

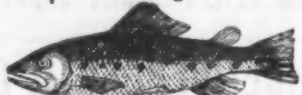


TIN LINED IRON PIPE.

A pure **BLOCK TIN PIPE** within a wrought iron tube, combining Parity, Strength, Durability and Cheapness.

TATHAM & BROTHERS,
82 Beekman Street, N. Y.

Philadelphia Fishing Tackle House

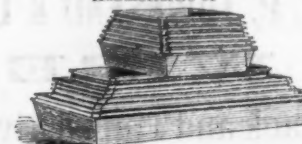


A. B. SHIPLEY & SON,
503 Commerce Street, PHILADELPHIA.
Manufacturers of
FISHING TACKLE, CHALK & FISHING LINES, FISH RODS, FLIES, LEADERS, RODS, REELS, &c.
A specialty of celebrated Green Heart Wood and Pine Brass and German Silver Rod Mountings. Our prize medal Bent and Glued and Green Heart Trout and Bass Fly Rods are the best in the world.
Sole Agents for John James & Sons' Fish Hooks, Needles, &c.
Price Lists to the Trade only on application.

JAS. CLAYTON.
Water, Air & Vacuum
PUMPS
Air Compressors.
Prices greatly reduced.
Send for circulars.
11 & 16 Water St.,
Brooklyn, N. Y.



LEWIS, DALZELL & CO.,
PITTSBURGH, PA.,
Manufacturers of



Patent DRIPPING AND BREAD PANS;
Also Cold Rolled Sheet Iron, Bar, Sheet and Tank Iron, and Nails.

O. LINDEMANN & CO.
Manufacturers of
Japanned, Brass and
Silver Plated
Bird Cages.
Office and Salesroom,
No. 254 Pearl St.
Factory,
252, 254 & 256
Pearl St.,
NEW YORK.
Importers of GERMAN TEA TRAYS
in four colors. Catalogues and Price
Lists furnished to the Trade only.



Lambertson's
HARDWARE PRICE BOOK
For General Hardware.

Now in the hands of the printer and will be ready for delivery about July 5th.
Leather Back and Corners, - - - \$10.00
Genuine Russia Leather Binding, - - - 12.00
A Price Book for General Hardware, with headings printed and also sizes and list price of many standard goods, such as Screws, Flies, Bolts, Tacks, Rivets, Butts, Hinges, Wire, &c. With a complete index. Printed on fine ledger paper, that will stand corrections. Plenty of space for cost and selling prices or quotations and comparisons, and blank pages ruled to match the rest of the book for new lines of goods. Round in the most substantial manner. Adapted to the wants of either the wholesale or retail dealer, for the buyer or salesman, the store, the office or the road. With this book to start on, a price book can be made in a week that would have cost two months' steady work in the old way.
Address **BUELL LAMBERTSON,**
97 Chambers St., New York.

SPECIALTY.
COAL WASHING MACHINES AND IMPROVED COKE OVENS.
S. DIESCHER,
Civil and Mechanical Engineer,
Cor. Smithfield St. & 6th Ave., Pittsburgh, Pa.

Japanese Paper Ware.
Centennial Award
to
Jennings Bros.
for the manufacture of the
Japanese Paperware,
Water Pails, Chamber and
Commode do. (Slop Jars),
Foot Baths and Water Car-
riers, Bowl and Pitcher,
Pans, Basins, Cuspidors, Spittoons, &c., &c.
Warehouse, 379 Pearl St., N. Y. City.
Trade supplied.

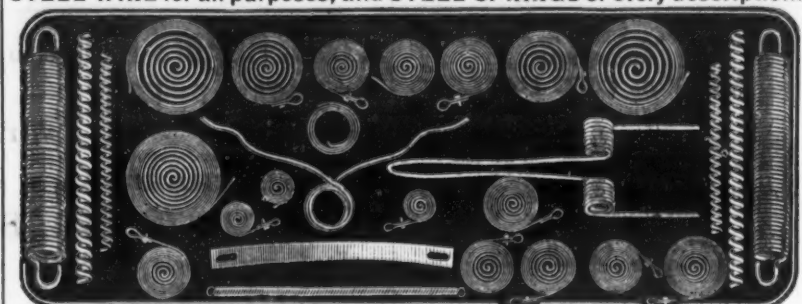


CHAS. E. LITTLE, 59 Fulton St., N. Y.
1760.
Solid Cast Steel Augers & Reamers
For Boring VAMP LOGS. All sizes in stock.
Socket Shanks, Ring Holes, and Connecting
Rods for the above to order. Also Trenching Tools
for jointing logs. Caspers' and Blaisers' Tools.
Tool Chests. Tools for all trades a specialty.



CARY & MOEN,

Manufacturers of
STEEL WIRE for all purposes, and **STEEL SPRINGS** of every description.



Market Steel Wire, Crinoline Wire, tempered and covered.
Also Patent Tempered Steel Furniture Springs, constantly on hand.
234, 236 and 238 West 99th Street, NEW YORK.

THE CHICAGO STAMPING CO.,

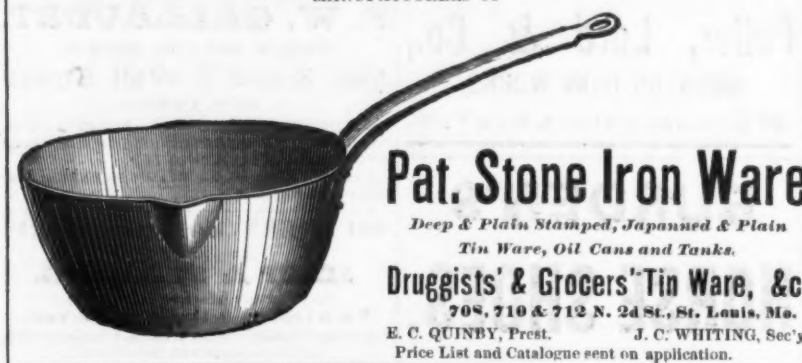
Manufacturers of Kitchen & House Furnishing Goods.



Western Agents for the
White Mountain Freezers, Summer Queen Oil Stoves and Eureka Wringers.
72, 74 and 76 Lake Street, Chicago.

METAL MFG. CO.,

MANUFACTURERS OF



SINGER, NIMICK & CO.,
PITTSBURGH, PA.
MANUFACTURERS OF ALL KINDS OF
HAMMERED AND ROLLED STEEL,
Warranted Equal to any Produced.

BEST REFINED TOOL CAST STEEL
For Edge and Turning Tools, Taps, Dies, Drills, Punches, Shear-Knives,
Cold-Chisels and Machinists' Tools generally.

SAW PLATES
For Circular, Mulay, Mill, Gang, Drag, Pit and Cross-Cut Saws.

Sheet Steel
For Springs, Billet Web and Hand Saws, Shovels, Cotton Gin, Stamping
Cold, &c., &c.

SIEMENS-MARTIN (Open-Hearth) PLATE STEEL
For Rollers, Fire-Boxes, Smoke Stacks, Tanks, &c.

All our Plate and Sheet Steel being rolled by a Patented Improvement is unequalled for surface
finish and exactness of gauge.

ROUND MACHINERY CAST STEEL
For Shafting, Spindles, Rollers, &c., &c.

File, Fork, Hoe, Rake, R. R. Frog, Toe-Calk, Sleigh-Shoe and Tire Steel, &c.
Cast and German Spring and Plow Steel.

Finished Rolling Plow Coulters with Patent Screw
Hubs attached.
Agricultural Steel cut to any pattern desired.
Steel Forgings made to order.

Represented at 59 BECKMAN ST., NEW YORK, by
HOGAN & BURROWS Gen'l Agents for Eastern and New England States.

A NEW
Drawer Lock.

"STANDARD."
Applicable also to Cupboards, etc.
Made wholly of Brass, and finely finished. Each
Lock has two flat, steel, nickel-plated Keys.
Dealers desiring to examine this Lock will re-
ceive a sample without charge, by addressing

The Yale Lock Mfg. Co.
STAMFORD CONN.

The Famous Improved
SHEPARDSON LOCKS
Are the "Best" in the World.

The United States Lock Co.,
Office and Manufactory, KINGSTON, MASS.

WM. F. DONOVAN, General Manager.
NEW YORK OFFICE, 97 Chambers Street.

Salt in Iron Manufacture.
Mr. James Barnett in a letter to Ryland's
Iron Trade Circular says:

There can be few if any persons in this district possessing a knowledge of the iron manufacture but who have some acquaintance with the worth of salt. But although so much used, desultorily, no one has taken any steps toward rendering it subservient to purposes of economy, nor reaped any persistently beneficial advantage from it as a purifying agent; yet in that respect it is of such potency as to be capable of doing everything in the way of physics that iron can require.

The secret of attaining the full measure of success this beneficent substance can afford, lies in its complete distribution, and its incorporation with auxiliary matter; that is, in puddling, with the clinder and the fettling. As a converter into steel from iron it has been appreciated, but as to how it should be available for making iron pure—making a material which shall have the strength without the brittleness of steel, to make the very commonest and worst of iron good, and this, not at a cost, increased, but, on the contrary, greatly reduced—this has not been among even the dreams of the iron interest. And this has resulted from the circumstance that none have assigned to salt the place it ought to occupy. It should have had the lead where it has only been subordinated. In point of fact, everything else than salt as "physic" might very well be thrown "to the dogs." There is no excellence but can be attained to through its use in chief.

One plan adopted by me in using salt in the puddling furnace is the following: I place a barrel in position convenient, and fill with water, into which sufficient salt is thrown to make a saturated solution. I throw in, say, a hundred weight of agricultural salt, and to what remains after the barrel has been emptied of this I add more water until the whole of the saline matter is dissolved. Water will only take up a certain quantity of salt, and if, after stirring, it is still found, the solution is sure to be of sufficient strength. To be certain of this, let some always remain at the bottom, or a salinometer may be used to test the solution's strength. Of this liquor I pour about half a bucket full into the furnace through the stopper hole, when the heat is out. This sets the clinder, and gives a bottom sufficiently refractory without the use of scrap. And I repeat at every heat, after the heat is out, the same amount of the solution poured still through the stopper hole, to make up for the dilution consequent upon the continual importation of fresh clinder into the furnace with every charge. But to do no more than this is not enough to insure the total saving of scrap. Therefore I throw the saline solution over the fettling also before use. Tap will not absorb much, pottery mine and bulldog will receive more, and the small fettling cannot be too well saturated.

Ordinarily the puddler fettles twice round during a shift, but under this process, particularly if the clinder, after the salt has gone in each heat, be well splashed up round the sides, once fettling round is about enough per shift. It takes, at the least, 3 cwt. of large and 3 cwt. of small at each fettling round; if, therefore, once fettling round will do instead of twice, it needs no more weighing to get the gain. There is, moreover, a saving of time in getting out each heat, and so distinctly is this the case that the puddler is not working fairly if he be not quicker in his heats than ordinarily. If the iron do not come to nature quicker, the balling up will be greatly facilitated, the toll being reduced. The furnace works hotter, also, owing to the diminished waste of heat through the bottom plate, as well as to the known fact that salt is a generator of heat; therefore, immediately the iron drops, the damper should be lowered to reduce the temperature; and if the metallic granules should be seen to preternaturally shine as they appear above the clinder, waste is going on owing to the furnace being too hot. If the puddler, working with a rich fettling, do not get an augmented yield, the fault is his. In testing the merits of this process, it is essential that the experimental puddler be allowed to go to the hammer directly the iron is ready to come out, without having to wait his turn with the slower working of the ordinary furnace, otherwise the experiment is inconclusive and unfair in respect to yield. Promptly worked there are here two more sources of gain, the saving of time of coal and a largely increased profit in additional yield. Theoretically, upon the point of quicker working there must necessarily be less loss through the diminished chance of oxidation after the ebullition of the clinder has ceased, and this is practically a result.

The merits of this process may be summed up under the following heads: The total saving of scrap, the partial saving of fettling, the saving of the men's time and the master's coal, the additional yield obtained, and such superiority of quality as must eventually enforce the universal adoption of this process, apart from all considerations else.

As regards saving in coal alone, I have before me an official return taken at the Rise Carr Works. Among other items of saving during six shifts, the coal was weighed by the firm into one furnace worked on my process against another worked as ordinarily. I used 42 barrows against 47 barrows, each weighing within a few pounds of 4 cwt.

With respect to comparative yield and fettling used, I have in my possession another official return, wherein during eight shifts I am credited with a yield in puddled bar of 10 tons 8 cwt. 0 qrs. 14 lbs. from 10 tons 5 cwt. 2 qrs. of pig; the consumption of fettling being: of best tap, 13 cwt.; pottery mine, 13 cwt. 2 qrs.; purple ore, 16 cwt.; ground bulldog, 15 cwt.; no scrap.

The greatest proportional advantage to be

gained under this process is with a lean pig and a fat fettling, although none can be so good as to be above improvement. And I would here say, once for all, that under no circumstances, and whatever may be the quality of pig or fettling, is it physically possible that deterioration of quality or weight can occur from the use of salt.

The Molders' Union and Discharged Convicts.

The *Molders' Journal* publishes the following article relative to the employment of discharged convicts by the Chicago Stove Works:

"We have often had occasion to write about prison labor and the unjust competition that prison contractors were enabled to wage against regular manufacturers, but the tables have been slightly turned on us for our advocacy of the regular manufacturers. The Chicago Stove Works, as is pretty well known, closed its doors to union men simply because they were union men, citizens and property holders of Chicago. In closing the shop against union men the concern found that to fill their places was no easy task; even the extensive acquaintance of 'Mann,' the superintendent, and the thousands of letters scattered all over the country seeking to entrap molders, failed to get the shop filled, and, as a last resort, application has been made to the prison authorities, not for contracts, but to send all discharged prisoners to Chicago.

"We have in our possession a letter which reads as follows:

Office of A. G. PATTON, HOLLOWWARE MFR.,
COLUMBUS, O., April 21, 1877.
R. Lape, Esq., Manager Chicago Stove Works
—DEAR SIR: This will introduce to you —
—, a first-class molder in every respect. I should be pleased to have you furnish him with work if you can conveniently do so.
Respectfully yours,
A. G. PATTON.
("Murray.")

"Very innocent, is it not? Mr. Patton is a contractor in the Ohio penitentiary. The party recommended was a discharged convict: The letter tells no tales to the uninitiated, but when such schemes are attempted it is well to remember that we have a private telegraph office, a private post office, and if necessary an underground railroad, by which all such information reaches us.

"We would like to know what the people and city authorities of Chicago think of this effort to replace honest mechanics with discharged convicts. Of what avail are courts of justice, a detective and police force, if, under the name of business, dozens of convicts can be imported into a city and honest men driven out?"

In a recent issue of the *Troy Daily Times* we find the following comments upon the preceding article:

We have received a letter from A. G. Patton, a hollowware manufacturer at Columbus, Ohio, relative to the above article, thoroughly exposing the perversity and untruthfulness of the *Journal's* statements. We commend the communication to the careful perusal of our readers. Mr. Patton writes:

Editor Troy Times: The article published in the *Molders' Journal* is a perversion of facts of which the editor was unquestionably aware, as he claims to have knowledge of a state of affairs which does not exist. As all the parties connected therewith are old Trojans, and I understand also the article has been copied by a Troy paper, I take the liberty of replying through your columns. The facts in the matter are as follows: The name of the person to whom the letter was given is John E. Campion, a former member of the molders' union in Troy, and a first-class workman. He served out a sentence in the Ohio prison in this city under the name of John Ryan, and while doing so conducted himself in a straightforward and upright manner, and expressed himself as being thoroughly reformed and wishing to live an honest life. After the expiration of his term of imprisonment, he requested us to help him obtain employment. In accordance with his wishes, and knowing him to be an excellent workman, I gave him the letter to Mr. Lape, who knew nothing of its existence, nor were there any arrangements for sending him such men. It shows the contemptible means the leaders and advisers of the molders' union use to deceive the honest workman by perversion of facts.
A. G. PATTON.

A new industry that is steadily growing into importance, is the turning of slabs of slate into imitation marble. The process is thus described: The slabs of slate are first surfaced by a planer, and brought to the required thickness, and patterns are then laid upon the slabs, and mallet and chisel work out the desired forms and moldings. The peculiar feature in the operation, however, is the marbleizing. The material for the latter is prepared in a vat, and the slab is let down upon the composition, which adheres to the surface of the slate; the slab is next baked in an oven for one night, then coated with a varnish manufactured for this special purpose, and after six repetitions of these processes, it is finally removed and polished, the surface presenting, as is well known, a beautiful appearance; and so firmly united to the slate is this coating that it cannot be scaled or chipped off without taking the slaty particles with it.

The Toledo Stove Company—David Bronson, president; I. M. Spear, vice-president; Theo. Bachman, secretary and treasurer; and Geo. L. Johnson, general manager—are located on the Detroit branch of the Lake Shore and Michigan Southern Railroad, and occupy a substantial two-story building 116x30 feet, and a foundry and molding room 55x130 feet, and during the present season another building will be erected to accommodate the finishing and pattern making departments. The company now turn out 120 different styles and sizes of cooking and heating stoves, beside a full line of hollowware. Among their specialties we may mention the "New Corn City," a very popular cook stove for wood or coal; the "Home Treasure," and the "Domestic," first-class wood cook stoves. Among their heating stoves are the "Radiant Home" base burner, well known among stove dealers; the "Sah-bury's Barrel Heater," the exclusive right to manufacture which this company owns. The office and salesroom of the company is located on St. Clair street, in the center of the business portion of the city.

Iron.

NEW YORK.

OGDEN & WALLACE,
Successors to G. M. G. SMITH & CO.,
IRON & STEEL,
85, 87, 89 & 91 ELM ST., N. Y.
**COMMON AND REFINED
BAR IRON.**
SHEET AND PLATE IRON,
HOOP, BAND AND SCROLL IRON,
Rod and Horse Shoe Iron,
Angle and T Iron,
Swedes and Norway Iron, Norway Nail Rods.
Iron of all sizes and shapes made to order.

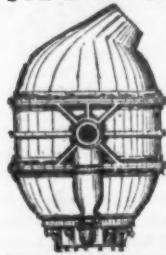
PIERSON & CO.,
24 Broadway, New York City.

Iron & Steel.

COMMON & REFINED IRON,
Hoops, Rods, Scrolls, Bands, Ovals,
Horse Shoe, Nail Rods,
Steel, &c.

Orders promptly filled from stock.

J. H. JACKSON & CO
206 & 208 Franklin St., N. Y.
Importers and Dealers in

IRON and STEEL.

Agents for
JOHN A. GRISWOLD & CO'S
Bessemer Steel.
MACHINERY STEEL,
Cast Steel and
SPRING STEEL,
ANGLE and T IRON.
Special Irons for Bridge and
Architectural Work.

ABEEL BROTHERS,
Established 1765 by ABEEL & BYVANCK,

Iron Merchants,
190 South Street and 365 Water, N. Y.
ULSTER IRON

A full assortment of all sizes constantly on hand.
Refined Iron,
Horse-Shoe Iron,
Common Iron.
Band, Hoop and Scroll Iron.
Sheet Iron.
Norway Nail Rods.
Norway Shapes.
Cast, Spring and Tire Steel, etc.

A. R. Whitney & Bro.,
Manufacturers of and Dealers in

IRON,

50, 52 & 60 Hudson,
18, 50 & 52 Thomas, and
12, 14 & 16 Worth Sts., } **NEW YORK.**

Our specialty is in
Manufacturing Iron Used in the Con-
struction of Fire-Proof Buildings,
Bridges, &c.
Plans and estimates furnished, and contracts made
for erecting Iron Structures of every description.
Books containing cuts of all iron made sent on ap-
plication by mail.
Sample pieces at office. Please address
58 Hudson Street.

BORDEN & LOVELL,
Commission Merchants

70 & 71 West St.,
New York.

Agents for the sale of
Fall River Iron Co.'s Nails,
Bands Hoops & Rods
AND
Borden Mining Company's
Cumberland Coals.

WILLIAM H. WALLACE & CO.,
IRON MERCHANTS
Cor. Albany & Washington Sts.,
NEW YORK CITY.

Wm. H. WALLACE. Wm. BISHAM.

DANIEL F. COONEY,
(Late of and Successor to Jas. H. Holdane & Co.)
88 Washington St., N. Y.

BOILER PLATES and SHEET IRON,
LAP WELDED BOILER PLATES.
Boiler Rivets, Angle & T Iron, Cut Nails & Spikes.
Agency for Pottstown Iron Co., Vindicator Iron Works,
Lebanon Rolling Mills, Pine Iron Works, Laurel Iron
Works. The Bergen Rolling Mills at Jersey City.

W. & J. TIEBOUT,

MANUFACTURERS OF

Brass, Galvanized and Ship Chandlery

HARDWARE.

390 Pearl Street, NEW YORK.

Iron.

NEW YORK.

G. HUERSTEL,
IRON and STEEL.
Warehouse, 99 Market Slip, N. Y.
IRON AND STEEL of all kinds
Constantly on hand. Horse Shoe Iron and Nails, Nor-
way Iron, Cast Spring, Toe Calk, and
Bessemer Steel Tire.
Also, SPRINGS, AXLES and BOLTS,
For Truck and Carriage Makers.

A. B. Warner & Son,
IRON MERCHANTS,
28 & 29 West and 52 Washington Sts.
BOILER PLATE,

Boiler Tubes, Angle, Tee & Girder Iron,
Boiler and Tank Rivets.
Sole Agents for the celebrated

"Eureka," Pennocks,
"Wawasset," Lukens,

Brands of Iron. Also all descriptions of Plate, Sheet,
and Gasometer Iron. Special attention to Locomotive
Iron. Fire Box Iron a specialty.

POWERTVILLE
ROLLING MILL,
JOHN LEONARD,
450 & 451 West Street, NEW YORK.
Manufacturer of Best Quality

HORSE SHOE IRON,
And HOOPS. Also Best Quality
Cold Blast Charcoal Scrap Blooms,
And Dealer in OLD IRON.

Geo. A. Boynton
BROKER IN IRON
70 WALL ST., N.Y.

MARSHALL LEFFERTS

90 Beekman St., New York,
MANUFACTURER OF

AMERICAN**Galvanized Sheet Iron,**

AND AGENT FOR THE
Easton Sheet Iron Works, Easton Pa.

MANUFACTURER OF
Best Bloom, Charcoal & Refined Sheet Iron.

Galvanized Telegraph and Fence Wire
Galvanized and Tinned Roofing and Siding
Nails.

Galvanized Hoop Iron of all widths.
Galvanized Staples.

Corrugated Iron for Roofing, plain or gal'd.
Galvanized Bars and Chains for Cemetery
Railing.

Tin Plates, Spelter, and other Metals.

Dan'l W. Richards & Co.,

Importers of and Dealers in

SCRAP IRON,**Pig Iron,****OLD METALS.**

88 to 104 Mangin Street,
Foot of Stanton St., E. R., NEW YORK.

JAMES WILLIAMSON & CO.,

SCOTCH AND AMERICAN

PIG IRON,

No. 69 Wall St., New York.

Swedish & Norway Iron.

A Variety of Brands, including

IB 14 HP NYB 03

BARs suitable for Steel of all grades, Wire, Shovels,
Hoes, Scythes, Carriage Bolts, Nail Rods, Tacks, &c.
CHARCOAL PIG IRON for Bessemer and
Cast Iron.

RICK BARS for Steel Smelting and Re-rolling.
SCRAP or BAH ENDS.

Direct Agency for N. M. HÖGLUND, of
Stockholm, represented in the United States by

NILS MITANDER,
69 William St., New York, and 24 Congress
Street, Boston.

ALBERT POTTS, Philadelphia, Pa., AGENT.

B. F. JUDSON,

Importer of and Dealer in
SCOTCH AND AMERICAN

Pig Iron.

Wrought & Cast Scrap Iron.
English and American

HORSE SHOE IRON, &c.,
457 & 459 Water St.,
and 235 South St., } **NEW YORK.**

Iron.

NEW YORK.

T. D. HAZARD,
BROKER IN
NEW & OLD RAILS,
Foreign and Domestic
PIG IRON,
Wrought and Cast Scrap Iron
AND GENERAL METALS.
204 Pearl St., New York.

U. O. CRANE.

BROKER IN

PIG IRON & METALS,
104 John St. New York.

John W. Quincy,
98 William Street, New York.

Anthracite & Charcoal Pig Irons,
Wrought Scrap, Cut Nails, Copper,
BLOCK TIN, LEAD, SPELTER, ANTIMONY, NICKEL, &c.

BOONTON
CUT NAILS,
HOT PRESSED NUTS,

Machine Forged Bolts,
Washers.

Fuller, Lord & Co.,
BOONTON IRON WORKS,
139 Greenwich Street, New York.

BURDEN'S
HORSE SHOES.

"Burden Best"
Iron
Boiler Rivets.

Burden Iron Works, H. Burden & Sons

Trov. N. Y.

OXFORD IRON CO.,
Cut Nails and Spikes,

R. R. Spikes, Splice Bars and
Nuts and Bolts,
81, 83 & 85 Washington, near Rector St., N. Y.
JAMES S. SCRANTON, Agent.

Passaic Rolling Mill Co.,
PATERSON, N. J.

Iron Bridge Builders

And Manufacturers of

TEES,**Merchant Iron, &c., &c.**

New York Office, 138 Chambers Street.

WATTS COOKE, President.
W. O. FAYERWEATHER, Treasurer.
CHAS. O. BROWN, Engineer.

Bonnell, Botsford & Co.,
Iron, Nails & Spikes.

YOUNGSTOWN, OHIO.

SPENCER & UNDERHILL,

94 Chambers St., N. Y., Agents for

American Screw Co.'s Wood, Machine and
Rail Screws, Stove and Tire Bolts, Rivets, &c.

O. Ames & Sons, Shovels, Spades and Scoops.

A. Field & Son, Tacks, Brads, Nails, &c.

G. F. Warner & Co., Carriage Clamps.

We have also on hand a general assortment of Hardware.

THOMAS J. POPE & BRO.
BORAX
Of finest Qualities. METALS.
292 Pearl Street, near Beekman, N. Y.
Anthracite, Charcoal and Scotch Pig Irons, Ingot
Copper, Lead, Bismuth, Tin, Antimony, Aluminum,
Spelter, Nickel, &c., &c.

Iron.

NEW YORK.

J. & J. Rogers Iron Co.,
AUSABLE FORKS,
Essex Co., - - - N. Y.

Manufacturers of
FINE CHARCOAL

Blooms & Bars
For Conversion into Cast Steel.

ALSO,
Horse Shoe, Round Square and

FLAT IRON,
Exclusively from Palmer Ore.

Agents
Merritt Trimble, - - - 21 Platt St., N. Y.
John Moorhead, - - - Pittsburgh, Pa.

HARRISON & GILLOON

IRON AND METAL DEALERS,
555, 560, 562 WATER ST., and 323, 324, 326 CHERRY ST.,
NEW YORK.

have on hand, and offer for sale, the following:
Scotch and American Pig Iron, Wrought, Cast and
Machinery Scrap Iron, Car-Wheels, Axles and Heavy
Wrought Iron; also old Copper, Composition, Brass,
Lead, Pewter, Zinc, &c.

Geo. R. Wood, Benj. B. Leman.

WOOD & LEMAN,

IRON and STEEL RAILS,

OLD RAILS,
Pig, Bar & Scrap Iron, Cars & Locomotives,

W. E. COFFIN & CO.'S
Franconia & Pembroke Bar Iron,
And Patent Straightened Shafting.

33 WALL ST., NEW YORK.

P. W. GALLAUDET.

Banker and Note Broker,
Nos. 3 and 5 Wall Street,
NEW YORK.

HARDWARE, METAL, IRON, RUBBER, SHOE,
PAPER AND PAPER-HANGINGS, LUMBER, COAL
AND RAILROAD PAPER WANTED.
ADVANCES MADE ON BUSINESS PAPER AND
OTHER SECURITIES.

SOUTHERN HOLLOW WARE,

Manufactured by
JESUP & STERLING,

(Successors to Blackwell & Burr.)
7 & 9 CHURCH Street, (near John), New York.

Proprietors **POCASSET IRON WORKS,** Established 1824.
Agents **HARRINGTON NAIL WORKS.**

Iron and Steel, Railroad Supplies, Burden's Horse Shoes,
Grindstones, Knaped, Tinned and Plain Ware.

TAYLOR IRON.

Unequalled for
Strength, Soundness and Uniformity,
and Capable of Receiving the
Highest Finish.

Orders executed from store with immediate dis-
patch.

RANDALL & JONES,

Sole Representatives in the United States
and Canada,
No. 10 Oliver St., Boston.

BOSTON ROLLING MILLS

Manufacture
Extra quality small Rods, from best selected Scrap Iron.

SWEDISH AND NORWAY SHAPES,
Nail and Wire Rods. Also,
Horse Shoe Iron, Hand Made

Horse Shoes & the Boston
Horse Shoe.

BOSTON ROLLING MILLS, W. B. ELLIS, Treas.
Office, 17 Battery March St., Boston.

Spooner & Collins,

COMMISSION AGENTS,
PIG IRON

Blooms, Bar, Sheet & Hoop Iron.

217 N. Third St., St. Louis.

SABLE IRON AND NAIL WORKS.

ESTABLISHED 1828.

ZUC & CO.,

Our Rolling Mill and Nail Factory having been remodeled, possess all modern improve-
ments and facilities for the manufacture of Iron and Nails, enabling us to place on the market
goods of a superior quality and finish. Our Nails are selected by the use of "Coyne's
Automatic Nail Picker." Our Iron is especially adapted for uses when quality is a considera-
tion, and by the use of our Universal Mill we are able to fill orders of odd sizes of Iron with
promptness.

OFFICE and WORKS: Etna and 13th Streets, Pittsburgh Pa.

WESTFÄLISCHE UNION.

Action-Gesellschaft für Bergbau, Eisen und Draht-Industrie,

Hamm, Westphalia, Germany,

WORKS at Hamm, Nachrodt, Lippstadt, Werdohl, Kinsal, St. Petersburg:

MANUFACTURERS OF

CUT NAIL RODS,
WIRE NAILS,
Bolt and Rivet Iron,
Hoop Iron, Nail Iron,
Iron for Horse Shoe Nails,
Washers,

Iron Wire,
Drawn Bright Wire,
Drawn Rope and Steel
Wire,
Drawn Coppered, Tinned
and Galvanized Wire,

Galvanized and Oiled Tel-
egraph Wire,
Upholsterers' Springs,
Bolts and Rivets,
Nuts, Screws.

American Office, 15 Gold St., N. Y. Represented by Thos. Prosser & Son.

WHITEHEAD BROS.,
Office and Retail Yard, 517 WEST 15TH STREET, NEW YORK. Dealers in all grades

NEW JERSEY, NORTH RIVER, CRESCENT AND ALBANY

MOULDING SANDS.
Also FIRE SAND, FIRE CLAY, KAOLIN and all kinds of

FOUNDRY FACINGS!

Iron.

PITTSBURGH.

PENNSYLVANIA IRON WORKS.

EVERSON, MACRUM & CO.
Pittsburgh, Pa.

Manufacturers of every description of
Bar, Sheet and Small Iron,
Make a specialty in

Fine and Common Sheet Iron.

A. G. HATRY,

Manufacturers' Agent and Broker
Bar, Sheet, Tank, Boiler, Angle, T,
and Railroad Iron.

Nails & Spikes, Steel & R. R. Supplies,
PITTSBURGH, PA.

COYNE & HATRY,

Patentees and Manufacturers of
Automatic Nail Selectors,

Improved Cut Nail Machines,
AND NAIL FACTORY SUPPLIES.

Works, cor. 30th & Mulberry Sts.,
OFFICE, No. 114 & 116 Water St., Pittsburgh, Pa.

SHOENBERGER & CO.,

Manufacturers of the

JUNIATA

Horse & Mule Shoes

NAILS AND SPIKES,

Horse Shoe Bar,

AND

SHEET IRON.

Goods warranted equal to any in the
Market. Send for Circulars in regard
to "PICKED NAILS."

Cor. 15th and ETNA STREETS,
PITTSBURGH, PA.

W. P. TOWNSEND & CO.,

Manufacturers of

WIRE

AND

Black and Tinned Rivets

Of Choicest Charcoal Iron.
Rivets any diameter up to 7-16 inch and ANY
LENGTH required.

19 & 21 Market St., Pittsburgh, Pa.

BRADLEY, REIS & CO.,

NEW CASTLE, PA.,

Manufacturers of every description of

PLATE & SHEET IRON

OFFICE, at Works.

A. J. NELLIS & CO.,

Pittsburgh.

Manufacturers of Steel or Wrought and Malleable
Iron Castings, Castings, Railings, &c., warranted free
from breakages. Special attention given to orders for
approved designs for Centurians. Also, manufacturers
of Agricultural Steels of all descriptions.

Steels finished and tempered by NELLIS' PROCESS
to suit any kind of soil. Special attention given to the
manufacture of Nells' Original Harpoon Horse Hay
Fork Grapple and Wood Wheel Wrought Frame Horse
Fork Pulleys. 137 Medal awards on all goods of our
manufacture exhibited at the Centennial.

GEO. S. MOORE & CO.,

PIG IRON, IRON ORE, FIRE BRICK.

LOUISVILLE, KY.

Iron.

PHILADELPHIA.

T. Horace Brown,
IRON, METALS & MINERALS,
205½ Walnut St., PHILADELPHIA.
AGENT FOR
Bechtelsville Iron Co.,
Wood Bros.' Charcoal Blooms & Billets
Virginia Bessemer Ore Co.

THE CAMBRIA IRON WORKS,

Situated on the line of the Pennsylvania Railroad, at the western base of the Alleghany Mountains, are the largest of their class in the United States, and are now prepared to make

2000 TONS PER WEEK,

Of Iron and Steel Railway Bars.

The Company possesses inexhaustible mines of Coal and Ore, of suitable varieties for the production of Iron and Steel Rails of

BEST QUALITY.

Their location, coupled with every known improvement in machinery and process of manufacture, enable them to offer Rails, when quality is considered, at lowest market rates.

The long experience of the present Managers, of the Company, and the enviable reputation they have established for "CAMBRIA RAILS," are deemed a sufficient guarantee that purchasers can at all times depend upon receiving rails unsurpassed for strength and wear by any others of American or foreign make. Any of the usual patterns of rails can be supplied on short notice, and new patterns of desirable weight or design will be made to order. Address,

CAMBRIA IRON COMPANY,

218 S. 4th St., PHILADELPHIA.

or at the works, JOHNSTOWN, PA.

Iron.

PHILADELPHIA.

H. L. GREGG & CO.,
Ship Brokers & Commission Merchants,
Importers of
Old Iron, Metals and Rags.
Freight engagements made to all parts of the world. Marine insurance effected in reliable offices.
108 Walnut St., Phila.

W. D. WOOD & CO.'S

PATENT
Planished Sheet Iron.

Patented March 14th, 1865; April 8th, 1873;
Sept. 9th, 1873; Oct. 6th, 1874; Jan. 11, 1876.

Guaranteed fully equal in all respects to the

IMPORTED RUSSIA IRON,
and at a much less price.

FOR SALE,

by all the principal

METAL DEALERS

In the Large cities throughout

THE UNITED STATES.

And at their Office,

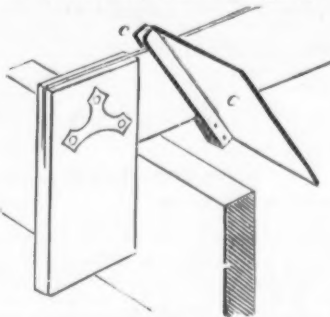
111 Water Street PITTSBURGH, PA.

New Patents.

We take the following abstract of new patents, recently issued, from the official record:

SHADE FOR TRY SQUARES.

To C. B. Hopkins, Topeka, Kan.—April 17.—
1. The combination, with a try square, of a



shade constructed to operate substantially as described.

2. The shade C, provided with the spring clamp c, or equivalent device, for attaching it to the blade of a try square.

189,630.—Hydraulic Press.—Francis S. Kinney, New York, N. Y.—April 17.

Water is forced by the pump into one cylinder to compress air in the other. When the resistance reaches a certain point a safety valve is opened, and the water is then forced into the tank.

189,649.—Hoisting Apparatus.—Matthias Penny-packer, Philadelphia, Pa.—April 17.

On the same shaft are pulleys of different diameters on opposite sides of a worm wheel, which is revolved by a haul rope around a drive wheel.

189,651.—Lubricator for Steam Engines.—James Powell, Cincinnati, Ohio.—April 17.

189,882.—Ore Washer.—H. E. Taylor, Chester, England.—April 17.

A series of conical drums projecting into each other, provided with internal screw threads varying in pitch and depth, and each supplied by a pipe with water for washing the minerals to be sized. The whole revolves on friction rollers.

7623.—Pat Office Box.—J. H. Beidler, Lincoln, Ill., assignor to T. F. Keating, Pittsburgh, Pa.; said Keating assignor to the Yale Lock Manufacturing Company, Stamford, Conn. Patent No. 57,464, dated Aug. 28, 1896.—April 17.

7624.—Pat Office Box.—Reissued.—W. H. Bramble, Decatur, Ill., assignor to the Yale Lock Manufacturing Company, Stamford, Conn. Patent No. 53,562, dated April 8, 1876; auto-dated March 30, 1896.—April 17.

Business in Ancient Pompeii.—One of the most interesting discoveries in recent years in Pompeii was made in 1875, when a wooden chest was brought to light, containing the business receipts of one L. Caecilius Jucundus. The chest crumbled to dust on exposure to the air, but the tablets on which the receipts were written have at length proved to be legible in many instances, and the results of a careful study of these tablets by Mommsen and others, has been to clear up several points in what was among the Romans a matter of great consequence, viz., the position of the middleman in affairs of business. There was not among the Romans the same extensive systems of shops as with us, supplying every possible article of necessity or luxury, and for this reason there arose innumerable occasions of private persons desiring to dispose of this or that article, as for instance, a surplus of agricultural produce, old carts, old plows, and even old and invalid slaves, as Cato recommends the land owner to do. The tablets in question are dated, according to custom, by giving the names of the consuls for the year. The greater part of the dates fall between A. D. 53-62. A few are as early as 15 and 27. Since there is no more recent date than 62, it becomes highly probable that the tablets of Jucundus had been overwhelmed in the earlier eruptions of Vesuvius. The majority of the tablets are triptychs, and are written partly with letters on wax, spread on the tablet, and partly in ink on the bare wood. Among them there is only one which gives the amount of commission which he received, and that proves to be two per cent., which is known from other sources to have been the general rate. Usually he merely says, "minus the commission." The person to whom this expense falls was the buyer.

The effect of machinery upon the industrial interests of the world generally, is a subject that frequently engages the attention of the economist. In this connection the following estimates of the labor-saving effects of steam motive-power, made by Dr. Engel, the head of the statistical bureau at Berlin, Germany, will be interesting. According to Dr. Engel, the aggregate steam motive power at present in use in the world is three and one-half millions horse-power, employed in stationary engines, and ten millions horse-power in locomotive engines, making a total of thirteen and one-half millions horse-power. This force is maintained without the use of animal food, except by the miners who dig the coal and provide the fuel, and the force maintained in the muscles is to the force generated by the product labor as about one to 1000. This steam-power is equal to the working force of 25,000,000 horses, and one horse consumes three times as much food as one man. The steam power, therefore, is equivalent to the saving of food for 75,000,000 human beings. Again, three power-looms, attended by one man, produce daily seventy-eight pieces of cotton fabric against four pieces produced by one hand-loom worked by one man in the year 1800. Again, a carpenter's planing-machine does the work of twenty men. McCormick's reaper doubled the grain produc-

tion of the United States of America by enabling the available labor to harvest the extended crops. This, of course, is but the merest outline of what is accomplished by the use of steam-power and labor-saving machinery.

In connection with the working of the Bessemer process, a very simple invention has been suggested by Mr. T. A. Freeston, of Attercliffe, Sheffield, with regard to the construction of the lower part of the converter. Hitherto the arrangements in the vessels for the introduction of streams of air into the same as required, has consisted of fire-clay tuyeres of a nearly cylindrical form inserted in the lining of the lower part of the vessel, such tuyeres being slightly tapered at the lower end, in order to render them capable of resisting the pressure to which they are exposed. Now, Mr. Freeston's invention consists in dispensing with the use of such inserted tuyeres by forming in the lining of the vessel itself suitable perforations, through which the said streams of air are intended to be forced by the ordinary means. These perforations are formed in the "ganister" or other material of which the said lining is composed, by inserting therein tapered pins or plugs of metal or wood or other substance, and ramming the "ganister" or other material firmly round them. These pins or plugs are allowed to remain embedded in the "ganister" lining or lining of other material until it becomes thoroughly dried, either naturally by exposure to the atmosphere, or artificially by being baked in a stove or otherwise, after which they are removed, leaving suitable perforations in the said lining. In order to secure the "ganister" lining or lining of other material to the bottom plate, metallic studs are employed of a conical or other suitable form, adapted for fastening the "ganister" lining or lining of other material and metal bottom plate together as required.

The engineers of Holland are engaged in pumping the water out of the Zuider Zee, the large inland sea that covers so much of the domain of the Dutch nation. Little by little the waters of this sea daily sink; lower and lower, not to rise. In a few years this vast tract of virgin and fertile soil will be dry and ready to yield harvests and otherwise minister to the needs of the dense population of that small, yet truly great country. While this is doing, French engineers are arranging to cut through the Isthmus of Gades in North Africa, let the Mediterranean waters into portions of the Sahara sands, and restore the Triton Lake that all the power of the Roman Empire could not develop intelligence enough to revive. A cutting of twelve miles through desert sand will flood the basins that for two thousand years have burned and glowed under the fiery sun, will return to them the moisture and the verdure that for ages they have not known, and will "make the wilderness to blossom as the rose." A great lake will lie south of Algiers and Tunis, whose vapors will temper the fierce south winds and supply those countries with cooling and fertilizing rain.

During the Miocene period it is certain, from the character of fossil plants found at Atankerdruk, Greenland, and elsewhere, that the temperature must have been 30 deg. warmer than at present as far north as the seventeenth parallel. In the beginning of the Cretaceous period the Arctic climate must have been of not only a temperate, but sub-tropical nature. How to explain the change of climate is one of the most interesting of physical problems. A change of the position of the poles of the earth would account for the facts; but how did the position of the poles change? Mr. Twissden has examined, mathematically, the geological hypothesis that the displacement of the earth's axis of figure would be sufficient, and he concludes that the necessary deviation of 2 deg. would be followed by a tidal wave of twice the depth of the ocean. Messrs. Huxley and Knowles, in summing up the recent inquiries regarding the subject, thus guardedly express themselves: "If the earth be quite rigid, the redistribution of matter in the shape of new continents could never cause a displacement of the pole from its initial position of more than 3 deg. But if the earth have the power of readjusting itself, periodically, to a new figure of equilibrium, it is possible that the effect may be cumulative, and the pole may, therefore, have wandered as much as 10 deg. or even 15 deg. from its primitive position."

A new theory, based chiefly on chemical considerations, is propounded by Prof. Mendeleeff regarding the formation of petroleum in the interior of the earth. From the fact that in Pennsylvania petroleum occurs in the Devonian and Silurian rocks, it appears to him highly improbable that the fluid hydrocarbon should be the result of the decomposition of organic remains, for but little organic life could have existed in those ages. His theory, starting with Laplace's hypothesis of the formation of our globe, assumes the existence of great masses of iron, and, along with it, of inorganic carbon, in the inner parts of the earth. The water which, from the more exterior regions, penetrates to the molten metal, is decomposed; its oxygen goes to the iron, while its hydrogen unites under the influence of great heat and pressure with the carbon to form the varieties of hydrocarbons which make up petroleum.

Diamond cutting, which has heretofore been carried on almost exclusively by the Jews of Amsterdam, has been taken up and successfully prosecuted by a class of 23 young women of Roxbury, Mass. The girls cut and polish the diamonds in a superior manner, and are found to be admirably adapted for that branch of industry, which seems to open a new field for female operatives.

The Mineral Resources of Canada.

Although there is no official record of the progress of mining in Canada, a very ample substitute has for the past 10 years been kept up by Mr. Robert Bell, C. E., F. G. S., of the Geological Survey of Canada, and to whom we are indebted for the exhaustive review for 1876, of which we are now enabled to give an abstract. Commencing with gold, Mr. Bell states that there has been a considerable falling off in the yield for the year, which is partly due to the loss of a considerable number of miners wrecked last autumn on a voyage from Victoria to San Francisco. Although Cassiar has produced the largest quantity, the Cariboo district still holds out well. In the latter a small stamp mill has been erected to test the numerous auriferous quartz veins which have been discovered. The Kootenay and Omineca districts have been almost deserted. The official report of the Minister of Mines gives the known exports at \$1,339,986, which, including the quantity taken away by private hands, would make the total yield \$1,786,648, against \$2,474,904 for 1875, calculated in the same way. On the North Saskatchewan the low water during the summer favored gold washing, which was carried on to a small extent as in previous years. No progress has been made in the development of any of the gold regions around Lake Superior. Beside the numerous veins occurring in the country north and west of this lake which have been found on assay to contain the precious metal, nuggety gold exists in quartz leads at the Jackfish Lake and Partridge Lake locations, and at Victoria Cape, opposite the State Islands. A vein at the last mentioned locality, which varies from 1½ to 3½ ft. in thickness, was found by Dr. Harrington, of the Geological Survey, to yield 4 cwt. of gold and 5½ ozs. of silver to the ton. In the Hastings region some mining and prospecting have been done, especially in the township of Kaladag, but the exact yield is not known. As to gold mining in Q. B. C., Mr. Rivard, the inspector of gold mines for that province, informs him that "it was only during the last months of 1876 that preparatory works were commenced on the River Famine, in the township of Wolford, by Mr. Reese, and on the River Gilbert, in the seigniory of Rigaud Valdreuil, by the Gilbert and Chaudiere Gold Fields Company, the St. Onge Company, and likewise a few other miners. The St. Onge Company alone has commenced to mine in the superficial gravel, and to extract gold. During about two months and a half (in October, November and December) they employed 20 men, and washed about 70 ozs. of gold. In the St. Francis division auriferous deposits have been discovered in several places, notably on the River Ditton, in the county of Compton, where the Hon. Mr. Pope has carried on exploratory works on his own land for several years. Several parties of miners have, in the course of the past year, made explorations in Chesham, Emberton (formerly the south half of Ditton), Ditton, and other townships in the county of Compton, and they report having found undoubted indications of the existence of the precious metal." The report of the Commissioners of Mines of Nova Scotia again shows an improvement in the yield of gold, the amount obtained in 1876 having been 12,069 ozs., against 11,308 ozs. in 1875, an increase of 831 ozs. The average value of Nova Scotia smelted gold is given in the report at \$19.22 per oz., so that the above amount would be worth \$231,389.58. The average number of men employed in gold mining was 371, and the yield per ton of quartz crushed was 15 cwt. 13 grs., against 15 cwt. 4 grs. in 1875.

The Lake Superior is the only region in the Dominion in which silver mines have been worked during the year. The Duncan mine has continued to improve. About \$35,000 worth of ore were ready for shipment in the autumn, and a considerable quantity had been sent off earlier in the season. A stamp mill was erected under the direction of Prof. W. O. Courtis, the skillful manager of the mine, which is said to have been producing from \$4000 to \$6000 worth of silver a month during a part of the winter. Very rich ore is said to have been struck lately in the central shaft at a depth of about 360 ft. Col. Wilson has continued the operations with a small force of men at the 17 K mine. Promising discoveries of silver veins have been made near Pigeon River by Messrs. W. A. Kindred & Brother, who have sunk a shaft to a depth of 40 ft. at a place called Elizabeth, 1½ miles north of the American boundary. A large quantity of land has been taken up in the neighborhood, and some of the owners had commenced prospecting toward the end of the season. The Silver Ilet has been amalgamated with the Ontario Mineral Lands Company with a united capital of \$1,000,000, and the large stamp mill is said to have produced between \$300,000 and \$400,000 worth of silver, but the amount has not been officially stated. The boring with the diamond drill was to have been continued during the winter until an additional depth of 400 ft. (or 1400 in all) had been tested; 18 miners have been employed. At the Little Pick silver lode, Mr. Peter McKellar carried on work with a party of miners during the summer, and produced a quantity of valuable silver ore, principally in the form of argentiferous galena. Mr. A. F. Aureore continued his fishing and mining operations at the State Islands. The silver ore reported to have been discovered at Thirty-one Mile Lake, 60 miles up the Gatineau River, Mr. Vennor says proved to be partly silvery mica schist, and partly iron pyrites in a greenish hornblende rock.

A rich vein of copper ore, 4 ft. in width, has been discovered 2½ miles from Salmon Arm, Jarvis Ilet, in British Columbia, and an adit has already been driven a short distance on its course. The Quebec and Lake Superior Assg.

[Continued on page 7.]

Kensington Iron & Steel Works.
JAMES ROWLAND & CO.,
920 N. Delaware Ave., PHILADELPHIA,
Manufacturers of
The Anvil Brand
BEST REFINED IRON.
Rounds, Squares and Flat Bars, Bands, Skelps, Hoop and Horse Shoe Iron, Ovals, Half Ovals, Half Rounds, Scrolls and Nut Iron. An assortment of sizes constantly in stock. Also Plow, Cultivator, Hoe and Shovel Steel. Send for Price List.

PENCOYD IRON WORKS.
A. & P. ROBERTS & CO.,
Manufacturers of
CAR AXLES.
BAR, ANGLE, TEE AND CHANNEL IRON.
Office, No. 265 S. Fourth St., Philadelphia. Agents for the sale of Glamorgan Pig Iron.

FOUNDRY FACINGS.
GERMAN LEAD, BITUMEN, SIEVES, MACHINERY SAND,
AMERICAN LEAD, ANTHRACITE, SHOVELS, BRASS,
GRAPHITE, CHARCOAL, BRUSHES, CHANDELIER "
PLUMBAGO, MINERAL, CRUCIBLES, STOVE PLATE "
J. W. PAXSON & CO. 514, 516 and 518 Beach St., Philadelphia, Pa.

SUSQUEHANNA IRON CO.,
Columbia, Lancaster Co., Pa.
Manufacturers of and Dealers in
IRON,
All leading sizes made to order and of uniform quality. Such as Flat, Rounds and Square Bars, Ovals, Half Ovals and Half Rounds.
Works situated on the line of the Pennsylvania R. E. and at the junction of Reading and Columbia Northern Central and Columbia and Port Railroad.

A. PURVES & SON,
Corner South & Penn Streets, Phila.
Dealers in
Scrap Iron & Metals, Machinery, Tools,
Shafting & Pulleys, Steam Engines,
Pumps & Boilers, Copper, Brass,
Tin, Rabbit Metals, Foundry
Facings. Best Quality Ingot Brass.
Cash paid for all kinds of Metals and Tools.

Moseley Iron Bridge & Roof Co.,
CORRUGATED IRON
Buildings, Roofs, Shutters, Doors, Iron
Sashes, Skylights, &c.
5 Day Street, New York.

S. B. LOWE,
Chattanooga, Tenn.
Pig Iron & Commission
Special Sales Agent of
Rising Fawn, Chattanooga & Cherokee
Furnaces.

Siemens' Regenerative
GAS FURNACE.
RICHMOND & POTTS,
119 S. Fourth St., PHILADELPHIA, PA.

The Iron-Masters' Laboratory.

Exclusively for the Analysis of Ores of Iron, Pig and Manufactured Iron, Steels, Limestone, Clays, Slags & Coal for Practical Metallurgical Purposes.
No. 339 Walnut Street, Philadelphia.
J. BLODGET BRITTON.

This Laboratory was established in 1866, at the instance of a number of practical Iron-masters, expressly to afford prompt and reliable information upon the chemical composition of the substances above mentioned, for smelting and refining purposes. The object being to make it at once a convenient, practically useful, and comparatively inexpensive adjunct to the Furnace, Forge and Rolling Mill.

CHARGES TO IRON WORKS.

For determining the per cent. of Pure Iron in an ordinary Ore..... \$4.00
For the per cent. of Pure Iron, Sulphur and Phosphorus in do..... 12.50
For each additional constituent of usual occurrence..... 1.50
For those of unusual occurrence or difficult to determine, the charge must necessarily depend upon circumstances.
For determining the per cent. of Sulphur and Phosphorus in Iron or Steel..... 14.00
For each additional constituent of usual occurrence..... 6.00
For the per cent. of Carbonate of Lime, and Insoluble Silicious Matter in a Limestone..... 10.00
For each additional constituent..... 2.00
For the per cent. of Water, Volatile Combustible Matter, fixed Carbon, and Ash in Coal..... 12.50
For determining the constituents of a Clay, Slag, Coke, or of an Ash of Coal the charges will correspond with those for the constituents of an ore.
For a written opinion or letter of instruction the charge must necessarily depend upon circumstances.
Printed instructions for obtaining proper average samples for analysis furnished upon application.

C. C. Harlow & Co.,

BRIDGEWATER, MASS.,

DAMAN Standard Hollow Augers,

Universally acknowledged superior to any other in the market. They have recently been improved, making them, as now offered to the trade, the most perfect tool of their kind, either in design, material or workmanship.

Spoke & Dowel Trimmers

The very best as well as cheapest.

Metallic Combination Plow Plane,

Made of solid cast steel and of gun metal. Of an entirely new design. Can be used as Groover, Dado and Ribbet Plane, in any direction of the grain and also as a Match Plane.

Common Sense Door Spring.

The most durable and cheapest Door Spring yet made.

LEAD PIPE CUTTERS.

To cut lead pipe in any position and without chips or burrs.

Please send for circulars and prices.

MEDAL AND PREMIUM

Awarded to
T. C. ALCOTT & SON,
Mount Holly, N. J.
For their Improved
Turbine Water Wheels.

Territory or right to manufacture For Sale.

GEORGE W. BRUCE,

No. 1 Platt St., New York,
Agent for CLEMENT & MAYNARD,
offers his usual unrivaled assortment of Plantation Tools, and asks particular attention to their Superior Handled Solid shanked hoe.

JOHN P. MOORE'S SONS, Wholesale Gun Dealers

Everything in the line. Eley's Goods. Colt's Revolvers, etc., etc. Bottom prices guaranteed.

300 Broadway, New York.

Geo. M. Eddy & Co.,

351 & 353 Classon Ave., Brooklyn, N. Y.

MEASURING TAPES.

Of Cotton Linen and Steel.

For all purposes for which Tape Measures are required.

Only manufacturers of

Paine's Patent U. S. Standard Steel Measuring Tapes,

Pat. Spring Measuring Tapes

of Linen and Steel.

FINE TEMPERED STEEL SPRINGS.

FINE TEMPERED STEEL HAND SAWS,

from 1/4 inch wide upward. Warranted tougher than

any other Hand Saw. Catalogue on application.



Iron.

CLEVELAND ROLLING MILL CO.,

Manufacturers of

Bessemer Steel & Iron Rails & Fastenings,
SPRING STEEL AND WIRE of all kinds,
STEEL HORSE SHOES, TIRE, AXLES & other Forgings.
Boiler Plate, Galvanized & Black Sheet Iron, Corrugated Roofing & Siding of
Siemens-Martin, Bessemer Steel & Iron.
All made from our own Lake Superior Ores.
CLEVELAND, O.
Agents for the UNION STEEL SREW CO.



ATKINS BROTHERS,

PROPRIETORS OF THE

Pottsville Rolling Mills & Pioneer Furnaces

POTTSVILLE, PENNSYLVANIA.

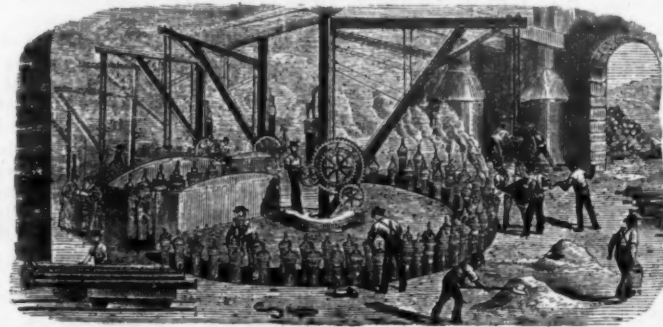
Having introduced New and Improved Machinery into their Rolling Mills, and manufacturing all their Iron from the ore, and also doing all Machine Work and Repairs in their own shops, they are enabled to produce

T and STREET RAILROAD IRON,

Of all Patterns and of uniform quality, unsurpassed for strength and wear, and of any required length. Address the Proprietors, Pottsville, Pa.

McNEALS & ARCHER,

BURLINGTON, N. J.



Flange Pipes.

General Foundry Work.

CAST IRON PIPES

FOR WATER AND GAS.

JOHN H. REED & CO., IRON MERCHANTS,

And Agents for BAY STATE IRON CO.,

Manufacturers of and Dealers in

Homogeneous Boiler & Fire Box Plates, Plate, Sheet, Pig & Railroad Iron. Wrought Iron Girder, Channel & Deck Beams.

ANGLE and T IRON, BOILER and TANK RIVETS, Lap-Welded Iron Boiler Tubes, Wrought Iron Steam and Gas Pipe.

OFFICES, 2 Pemberton Square, Boston, Mass.

THE CAMBRIA IRON AND STEEL WORKS,

Having enjoyed for over TWENTY YEARS the reputation of producing the best quality of Rails, have now an annual capacity of

100,000 Tons of Iron and Steel Rails, Splice Bars, &c.

Address CAMBRIA IRON CO., 218 South 4th Street, Philadelphia.

Or at the Works, Johnstown, Pa. Or J. S. KENNEDY & CO., New York Selling Agency, 41 Cedar St., N. Y.

IRON FOUNDRY.

ESTABLISHED IN 1840.

SAMUEL J. CRESWELL, Jr.,

N. E. Cor. Twenty-Third & Cherry Sts.,

PHILADELPHIA.

Iron Fronts, Stairs, Girders, Lintels, Columns, etc

ESTABLISHED 1826.

C. S. OSBORNE & CO.,

Manufacturers of SADDLERS' AND HARNESS MAKERS'

TOOLS.

No. 96 Mechanic St., NEWARK, N. J.

H. S. MANNING & CO.,

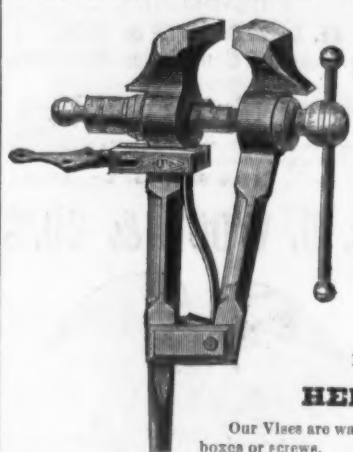
Sole Sales Agents for THE MORSE TWIST DRILL AND MACHINE CO.'S



111 Liberty Street,

NEW YORK.

NEW MODEL SWIVEL VISE.



The advantage claimed for this Vise over the ordinary patterns is in the ease with which it is adjusted to whatever angle may be required.

Trenton Vise & Tool Works

TRENTON, N. J.,

Manufacturers of

Solid Box Vises, Hammers, Sledges, Picks, Mattocks, Grub Hoes, &c.

Warehouse,

101 & 103 Duane Street, NEW YORK.

HERMANN BOKER & CO.

Our Vises are warranted to do more work than any other make. No broken boxes or screws.



WILSON MANUFACTURING COMPANY

NEW LONDON, CONN.

SOLID BOX VISES,
Composition and Steel Roller Bushings, Fishing Swivels, Coffee Mills, Jack Screws, Turning Lathes, Clamp Heads and Screws, Parallel Bench Vises, Bench Screws, Vise Screws, Box Chisels, Rivets, Sheaves, Block Pins, Riggers' Screws, Calkers' Tools, Tackle Blocks and GENERAL HARDWARE.

MALTBY, CURTISS & CO.,

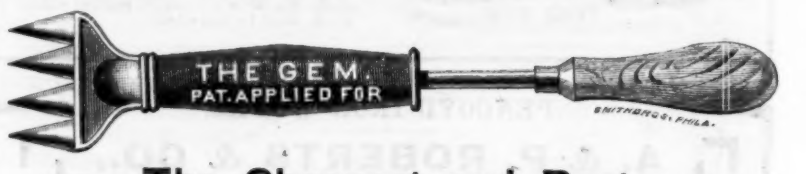
Manufacturers of

Metal Key Maple & Rosewood FAUCETS.

Also Manufacturers of
Capewell's Giant Nail Puller,
THE BUELL PEG FLOAT
and the Victor Knife Sharpener.
34 READE ST., N. Y.



THE GEM ICE PICK.



The Cheapest and Best.

Send for sample dozen.

Plain 2.00 per doz.
Bronzed and Galvanized 3.00 "
Show Card with every dozen.

LOVEGROVE & CO.,

No. 125 North Fourth Street, Philadelphia, Pa.,

Sole Manufacturers.

PERIN & GAFF MFG. CO.,

Cincinnati, OHIO.

MANUFACTURERS OF

Cast Butts, Wrought Butts,
Strap and T Hinges, Sad Irons,
Pulleys, Casters,
Knobs, Wagon Boxes,
Thimble Skeins, Piano Stools,
Knox and Universal Fluting Machines, Etc., Etc., Etc.

And Jobbers of GENERAL HARDWARE.

OFFICE AND SALESROOMS, 103 W. Pearl Street, Cincinnati, O.

PHILIP S. BIGLIN,

Successor to W. F. SHATTUCK & CO.,

Manufacturers' Agent for

AMERICAN HARDWARE.

100 Chambers St., New York,

Shattuck's Union and Counter Scales, Eddy's Axes, Hatchets, Picks, &c. Wellman's Gimlet's, Gimlet Bits, &c. Griswold's Augers, Auger Bits, &c. Halroyd & Co.'s Stocks and Dies. Yaw's "Genuine" Wrought Cow Bells, Barton's Hand and Sleigh Bells.

Maltby's Britannia and Cocoa Dippers. Eddy's Reduced Lamp Black. "Eagle" Axes, Pick and other Handles. "Eureka" Flint, Sand and Emory Papers. Cortland Forged Horse Nails. Tackle Blocks, Spokes, &c., &c.

W. & B. DOUGLAS,

MIDDLETOWN, CONN.

The Oldest and Most Extensive Manufacturers of

**PUMPS,
HYDRAULIC RAMS,
GARDEN ENGINES**

Yard Hydrants, Street Washers.

AND OTHER

Hydraulic MachinesIN THE
WORLD.

Awarded the **GRAND MEDAL** of PROGRESS at **WORLD'S EXPOSITION, VIENNA, 1873**, being the highest awards on Pumps, &c., also, highest medal at **PARIS** in 1867, and **Philadelphia, 1876**, accompanied by Report of Judges.

Descriptive Catalogues and Price Lists sent when requested.

BRANCH WAREHOUSES,

85 & 87 John Street, N. Y.

AND

197 Lake St., CHICAGO, ILL.

**UNION MANUFACTURING COMPANY,**

Manufacturers of all styles Plain and Ornamental Butts,

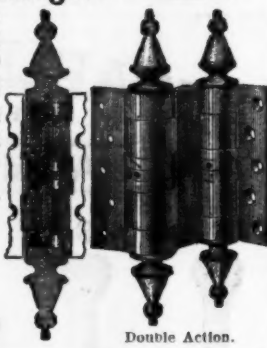
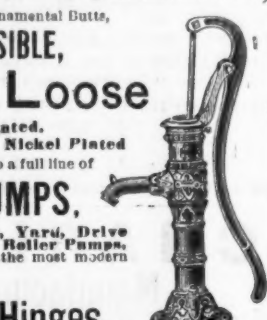
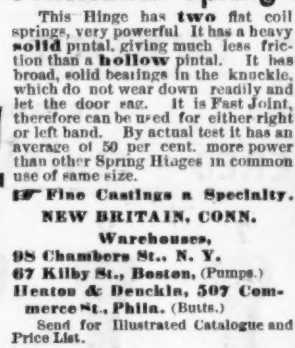
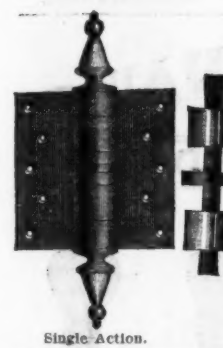
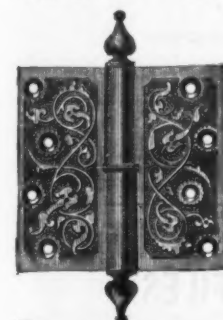
LOOSE PIN REVERSIBLE,

Cast Fast & LooseDrilled and Wire Jolated.
Japanned, Figured, Enamelled, Nickel Plated
and Real Bronze Butts. Also a full line of**IRON & BRASS PUMPS.**Cistern, Well, and Force Pumps, Yard, Drive
Well, Garden Engine and Steam Roller Pumps,
Hydraulic Rams, etc., and all with the most modern
improvements.**Centennial Spring Hinges.**

This Hinge has two flat coil springs, very powerful. It has a heavy solid pin, giving much less friction than a hollow pin. It is broad, solid bearings in the knuckle, which do not wear down readily and let the door sag. It is Fast Joint, therefore can be used for either right or left hand. By actual test it has an average of 50 per cent. more power than other Spring Hinges in common use of same size.

Fine Castings a Specialty.
NEW BRITAIN, CONN.

Warehouses,
98 Chambers St., N. Y.,
67 Kilby St., Boston, (Pumps.)
Henton & Denckla, 507 Com-
merce St., Phila. (Butts.)
Send for Illustrated Catalogue and
Price List.

**W. S. BLUNT'S**
Universal Force Pumps.

Secured by Letters Patent.

These Pumps have enormous power, and are for the house or for out-door wells of any depth. They are constructed with special regard to strength, ease of working and durability. They can be immediately changed from lift to force pumps, and the air chamber can be revolved, so as to allow the handle to work at any desired angle with the spout. Having close tops, they cannot be tampered with. Attention called to our new elegant pattern **Deep Well Non-Freezing Fire Pump**, called to our new elegant pattern **Deep Well Non-Freezing Fire Pump**, a complete protection against sand or gritty water in dry or frozen wells, pits, mines and rivers. For hand or steam pumps, all sizes, from 1/4 inch to 4 inch section pipe. Send for circulars to **W. S. BLUNT & CO.,** 21 Fulton and 21 Beekman St., New York. Western Agency—Newton & Hale, Chicago. Pacific Coast Agency—Dunham, Carrigan & Co., San Francisco, Cal.

The Oldest Shot Tower in America.
FOUNDED JULY 4, 1808.**THOMAS W. SPARKS,**

Manufacturer of

American Standard Drop and Buck
Shot and Bar Lead.

121 Walnut Street, Philadelphia.

Premium awarded by the Judges of the Centennial International Exposition for uniformity and general good finish of Pellets.

The Largest Pump Works in the World.Over 800 Different Styles.
**PUMPS, STEAM PUMPS, ROTARY
PUMPS, CENTRIFUGAL PUMPS,
PISTON PUMPS,**for Tanners, Paper Mills, Fire Purposes, suitable for all
situations imaginable.

Also, HAND FIRE ENGINES.

Send for Catalogue. Address,

RUMSEY & CO.,

Seneca Falls, N. Y., U. S. A.

Branch House, 93 Liberty Street, N. Y.
MARSH & CO., San Francisco and
Sacramento, Cal. General Agents for the Pacific Coast.
L. M. RUMSEY & CO.,
Branch House, 511 N. Main St., St. Louis, Mo.

Established in 1836.

Shelton Company,

Manufacturers of every variety of

TACKS & SMALL NAILS.Carriage, Machine, Plow, Stove and
Fire Bolts, Coach Screws,
Bed Screws, &c.
BIRMINGHAM, CONN.**Babcock's Sash Fastener,**

PATENTED JAN. 11, 1873.

Needs but to be seen to be Appreciated.

Send for Circular. Sample, 30c.

C. P. BABCOCK, Portland, Me.

State Rights For Sale.

The Mineral Resources of Canada.

[Continued from page 5.]

clation's mine is now considered by the owners to be sufficiently proved to justify the erection of a 50 stamp mill. The West Canada Company has gone into liquidation. These mines were in operation for 30 years—from 1847 to 1876—and produced copper to a total value of about \$3,300,000. In the province of Quebec the Canadian Copper and Sulphur Company reopened the old Acton Mine, in May, under the management of Capt. Richards. New engines and machinery were erected, the mine drained and cleaned out, and a considerable quantity of ore has been raised from the old open workings. Some mining has also been done in No. 5 shaft, and rich ore has been struck in this part of the mine, which now (April, 1877) looks exceedingly promising. It is difficult to estimate the total quantity of marketable material raised, as none of the ore has yet been crushed or shipped. Seventy men, on an average, have been employed. Miners' wages have been \$1.25 and laborers' 70 cents per day. About 750 tons have been treated by the Longmaid wet process. The mine was opened in 1865, and up to last year had produced upward of \$1,000,000 worth of copper. At the Huntington, in the latter part of the year, the mine was producing 350 tons of ore per month, and giving employment to about 60 miners and 40 surface men. Six out of the original nine furnaces damaged by fire in 1875 have been restored, and new vats have been built for reducing the ore by the wet method. The burners are 6 ft. high 3 ft. wide at the top and 1 1/2 ft. at the base. They are worked continuously. It is now proposed to smelt the ore in two cupola furnaces by means of gas made from wood, deprived of its moisture by Louden's process. The Harvey Hill Mine continued to be worked, but on a very small scale.

In New Brunswick a small vein was worked on Simpson's Island, in Passamaquoddy Bay. In Nova Scotia 45 tons of ore were produced, principally as the result of prospecting in the neighborhood of Polson's and Lochaber lakes, in Antigonish county.

The copper mines at Tilt Cove and Betts' Cove, Newfoundland, now rank among the first in the world, as may be judged from the fact that out of 37,191 tons of ore received at Swansea, the great copper market of Britain, during the last six months of 1876, no less than 20,763 tons came from these two mines. Tilt Cove sent 6031 tons, and Betts' Cove 14,732 tons. I have not at hand a record of the shipments for the first half of the year, but they are believed to be considerably less than for the last six months. The mine at Betts' Cove, which is only six miles south of Tilt Cove, is worked under the personal superintendence of Mr. Ellershausen, one of the proprietors, with a force of about 500 men, of whom 240 are employed about the mine itself, and 160 at other work in connection with it. The ore of both these consists of pyrites, in which the proportion of copper varies between about 7 and 16 per cent. Other deposits of copper ore are known in the same part of the island, and it is proposed to work two or three of them during the coming season.

With regard to lead, it appears that a promising vein of galena has been opened at a point about seven miles due north of the Garden River, near Sault Ste. Marie. The ore occurs in veins in a belt of soft, glossy green schist, 36 ft. in width, running north northwest, and enclosed in massive fine-grained syenite. The principal vein is on the east side of this belt, and consists of solid ore, varying from 5 to 19 in. in thickness. Another vein of galena and quartz, near the west side of the schist, is 10 in. thick, but the whole width of the belt is more or less intermixed with small veins of galena. Shafts have been sunk on the larger veins, each to a depth of 15 feet. The galena contains a small proportion of silver, and is mixed with more or less zinc blende. The work of developing the Frontenac Lead Mine, in the township of Loughborough, behind the Kingston, has been continued during the year by the Frontenac Lead Mining Company, of London. The vein averages 12 ft. wide, and continues to improve in depth to the westward, where it is worth two tons of galena per fathom. The portion hitherto worked is in gneiss rock, but when the intersection of the limestone band under the swamp is reached it is believed that it will prove extremely rich. The continuation of the vein beyond this swamp shows a good proportion of ore. A vein of argentiferous galena was worked during the year in the township of Barre, but particulars have not come to hand. In Nova Scotia prospecting for lead was carried on at Caledonia, in Guysborough county, and about 5 tons of the ore obtained were sent to England for sale. A sample of the galena of Little Whale River, on the east coast of Hudson's Bay, has been found by Dr. Harrington to contain over 5 ozs. of silver in the ton of 18 cwt. of ore.

Owing to the low prices prevailing, very little iron has been mined either in Ontario or Quebec. At Marmora a successful experiment has been made in smelting the ore of the "Big Bed," Belmont, by means of petroleum. Arrangements are being made for working several of the iron deposits north of Belleville as soon as the Grand Junction and North Hastings Railway is in operation. The Glenfower Iron Mine, in the southwest corner of Bedford, has been worked by from 10 to 20 men, and has produced about 2000 tons of ore, worth \$5.50 per ton, delivered in the United States. At the Machar Mine, near the last, 330 tons of similar ore has been raised and shipped to Messrs. Pierce, Kelly & Co., of Sharpsville, Pa., who are much pleased with its quality, and have ordered a further supply. Even the low price of

\$5.50 per ton at Cleveland left a small margin of profit. The agent of Messrs. Sanderson Brothers, of Sheffield, who are about to establish steel works at Syracuse, N. Y., reports the Bedford ores to be the best on the continent for their purpose. Operations have been suspended during the year at all the iron mines in the Ottawa Valley. In the Province of Quebec, the St. Maurice and L'Islet forges, near Three Rivers, have produced about 1900 tons of metal between them. The Radnor forge commenced running again in the early part of 1877. The St. Francis forge, at Riviere aux Vaches, is said to have produced nearly 1000 tons of iron during 1876. It is stated that an attempt to smelt the titaniferous ore of St. Urbain, Baie St. Paul, is again to be made under the direction of Mr. Piret, an experienced engineer from Belgium, by means of a process by which the cost will be only a little greater than that for the reduction of ordinary magnetic ore. In Nova Scotia, beside some prospecting in Pictou county, iron mining and smelting have been confined to the operations of the Steel Company, of Canada, at Londonderry, in Colchester county. The return made by this company to the Commissioner of Mines shows that in 1876 they raised 15,274 tons of ore, and employed 72 miners and 87 mechanics, laborers and boys about their mines. But little smelting was done, as their old charcoal furnace was blown out in the spring, and the new coke blast furnaces were not completed until late in the year. It may be here mentioned that an analysis of the brown hematite from the large deposit which I found below the last portage of the Mattagami River, or main trunk of the Moose, which was made by Mr. Hoffman, shows 52.42 per cent. of metallic iron.

During 1876 the quantity of coal produced and sold by the Vancouver Island coaleries was 140,185 tons, against 110,145 tons in the preceding year. The seams of the Vancouver Coal Company, which had been lost by a fault, were recovered by boring during the year. At the Harewood mine the elevated wire tramway has been got into operation since the close of the year. The seams worked in the island were: Vancouver Coal Company, two seams, 6 and 3 ft. respectively; Departure Bay (Wellington Company), one seam, 9 ft. 6 in.; Harewood mine, one seam, between 5 and 7 ft.; Union mine, one seam, 10 ft.; Bayne's Sound Company, two seams, 6 ft. and 5 ft. 10 in. respectively. The coal beds of the upper part of the North Saskatchewan are beginning to attract attention, and Mr. Moberley proposes bringing a trial shipment to Manitoba during the coming summer. The Nova Scotian coal trade has further declined in the year 1876—the output from 781,165 tons to 709,646 tons, and the sales from 706,795 tons to 634,207 tons. The production of albertite in New Brunswick has increased at the rate of about 1000 tons per year since 1872, when it was only 5000 tons, to about 9000 tons in 1876, or an average output of 180 tons per week. The mine is now 1250 ft. deep, but the vein at the bottom is only 4 or 5 ft. thick, and sometimes pinches to a few inches, whereas in one part which is now worked out it is 17 ft. thick. The Elgin Company were boring for the albertite mineral during the year on a location to the west of the above mine, and the Bellevue Albertite and Oil Company have been prospecting to the eastward of it.

The deposits of mineral phosphates of lime in Ottawa county, Quebec, are now attracting more attention than the longer known deposits elsewhere. The principal operations have been carried on by the Buckingham Mining Company, which is now fully organized with a capital of \$400,000. The company has opened offices in Montreal and at Buckingham village. It has under construction a steamer for towing barges on the Lievre River, and a mill for the manufacture of plumbago. During the year the company mined about 1400 tons of phosphate, and made a first shipment of 100 tons to England; the average between 80 and 85 per cent. of pure phosphate. The company employed between 25 and 30 men at mining during 1876, and will have 100 at work the present season. The researches of Mr. Venor, of the Geological Survey, show that a great trough of crystalline limestone exists between the Lievre and Gatineau rivers, toward the center of which the apatite will not probably be found as abundantly as along each of its sides. The shipments of phosphates were: From Montreal in 1874, 916 tons; in 1875, 1041 tons; in 1876, 2405 tons. From Quebec in 1875, 195 tons; in 1874, 224 tons; in 1875, nil; in 1876, 73 tons. Apatite yielding 80 per cent. pure phosphate sells in England at present for \$28.38 per ton, and the total cost up to the moment of delivery there is about \$15.90, leaving a profit of about \$12.48 per ton. The manufacture of soluble super-phosphate from Canadian apatite has been steadily continued by Mr. Alexander Cowan at the Brockville Chemical and Super-phosphate Works, but the enterprise has not yet begun to receive the encouragement which it deserves from the farmers of the Dominion. One of the principal markets has hitherto been found in Nova Scotia. Now that breadstuffs are likely to command a high price, it is to be hoped that this valuable manure for wheat lands will be better appreciated in the province of Ontario.

During the year a pyrites mine has been opened at St. Jerome, in Quebec, chiefly through the enterprise of the Rev. Father Labelle. In addition to the sulphide of iron, the ore contains traces of cobalt, nickel and silver. A workable deposit of iron pyrites, if found in the Lake Superior region, would be of more value than one in the eastern part of the Dominion, since it would be available for the manufacture of sulphuric acid in the Western States, where both coal and salt are cheap. These three substances are at the basis of various chemical manufactures, the products of which command high prices in the West. Mr. Cowan has continued to work his

pyrites quarry near Brockville, and is producing large quantities of sulphuric, nitric and hydrochloric acids.

Operations for slate have been prosecuted with vigor, under Mr. John Stewart, at the Rankin Hill Quarry, four miles east of Acton Vale, in Quebec. An average of 50 or 60 men have been employed during the year, principally in opening and developing the quarry, but a quantity of slate has also been prepared for market. The quarry contains both red and green slates, which are used principally for ornamental purposes. The colors, which are bright, do not appear to be liable to fade like those of the imported varieties, and the quality of the slates is otherwise good. They obtained a medal at the Centennial Exhibition. The production of the New Rockland Quarry, in the township of Melbourne in 1876 was only about 4000 squares, against 7300 in 1875. The number of men employed varied between 12 and 61, and averaged about 40 for the year. The internal dimensions of the quarry are now 350 ft. in length by 150 ft. in width, and from 80 to 120 (in different parts) in depth. In an article on Canadian roofing slates, written in 1863, Mr. Bell pointed out the prospect of obtaining a market in Europe for the excellent slates of the Melbourne brand, and now the New Rockland Company have entered into a contract to furnish in England at a good price all they can make during the present year. They propose to employ about 100 men, and expect to produce between 10,000 and 15,000 squares within a year.

Although occurring largely in Frontenac, Lunenburg, and Argenteuil, plumbago has only been mined in Warren county. The steam mill being erected by the Buckingham Mining Company is situated six miles west of the village of the same name. The 16 stamp mill of the old Canada Plumbago Company was burned in 1875, during which year and 1874 it had been employed in working up the ore on hand, principally into stove polish. The Dominion of Canada Plumbago Company have had a 20 stamp mill at work preparing various forms of plumbago for market. On the property belonging to this company the mineral occurs in the form of veins, on which several shafts have been sunk, and in the form of a bed of a less pure variety. The company were shipping a carload a week in January, and the splendid display of crude and manufactured plumbago, crucibles, &c., made by this company at the Centennial Exhibition was universally admired. Mica, which is valuable for making stove windows, mica powders, &c., occurs almost invariably along with the phosphate of lime in North Burgess and elsewhere, a large mass of it having been discovered in Chesterfield Inlet, on the west side of Hudson's Bay, in the central part of the Dominion.

The refractory properties of asbestos, which were well known to the ancients, render it available for a variety of modern purposes. As long as it was believed to be too scarce to be of much economic importance it was but little used outside of the chemist's laboratory, and a very small quantity supplied the market. Now, however, that it has been found so useful for steam packing, fire-proof roofing, &c., a considerable demand has been created. It is found in greater or less abundance in various parts of Europe, the finest coming from Italy. The United States are principally supplied from Staten Island and Maryland, but it is found also in Virginia, New York and other States. Its value ranges according to quality, from \$10 to \$50, delivered. In Canada asbestos is either known or reported to occur in various localities. In some of these the mineral is true asbestos, while in others it is either chrysotile or picrotite, fibrous varieties of serpentine, which answer the same purpose. The constantly increasing use of barytes for the fraudulent adulteration of white lead is giving it a value which it did not formerly possess in this country. The manufacture of Messrs. Thos. Ramsey & Co., of Montreal, consumed all that was produced in Ontario and Quebec in 1876. The barytes required in 1876 by the Dolphin Manufacturing Company, of Nova Scotia, for making paints, had to be imported, although in former years they obtained a sufficient supply at Five Islands.

With regard to petroleum, it appears that the total quantity of crude oil and distillate manufactured in the year ending June, 1876, was 4,838,215 1/2 gallons, and Mr. Bell estimates the crude oil sent from Petrolia at 220,000 barrels. It is difficult to obtain correct figures with regard to the petroleum business of Ontario, but it is believed that there are still between 300 and 400 wells in the Enniskillen region capable of producing oil, about half of which were in operation during the last year. The industry gives employment to about 500 men in the production, and to about 300 in the refining of the oil. The greater part of the crude oil is refined at London, Ontario, where some 15 establishments are in operation. For some years back but little petroleum was exported from Canada. However, toward the close of 1876 a revival in the trade commenced, and considerable shipments of refined oil were made. By the improved processes of refining a perfectly colorless and thoroughly decolorized illuminating oil, standing a high fire test, is now produced from our Canadian petroleum, at a price which enables it to compete in foreign markets with the best refined oils from the United States.

The most important fact of the year in connection with the salt interest in Ontario has been the completion of Mr. H. V. Attrill's boring at Goderich, which proves the great thickness of the rock salt under that region. It appears that six beds of solid rock salt were passed through, having an average thickness of 126 ft. A considerable portion of this thickness Dr. Hunt found to be almost chemically pure, containing over 99 1/2 per cent. salt. Mr. Attrill is about sinking a shaft to work these beds. The quantity of salt made in the whole of the Ontario region in 1876 was probably quite equal to that of the previous year, which amounted to between two and three millions of bushels. The returns with regard to gypsum were not to hand. In Nova Scotia and New Brunswick the average annual quantity was quarried and shipped. The demand for land plaster in Ontario is supplied from Northern New York, and from the comparatively thin beds of gypsum occurring along the lower part of the Grand River. The hydraulic cement consumed in the Dominion is supplied principally from Thorold and Limehouse. Should any considerable quantity of this material be required for the construction of the Pacific Railway, it might be manufactured from certain beds of the Neptun series of rocks at Thunder Bay, but the only way of determining the value of supposed cement stones is by actual experiment, as their chemical composition varies greatly, and every different kind requires some peculiarity in treatment suited only to itself. The granites of Canada may properly be noticed in connection with her other mineral resources. Mr. Robert Forsyth, of Montreal, continues to manufacture monuments, pillars, &c., from the beautiful granite of his island near Ghanarogue. A hill of similar granite on the east side of the harbor of Kingston has been leased by the Hon. John Young, of Montreal. The Bay of Fundy Red Granite Company are doing a large business in manufacturing granite at St. George, New Brunswick.—London Mining Journal.

USE THE BEST.



Pawtucket, R. I.

The American File Company have the exclusive right to use the Bernot process for cutting files. By this method all the advantages of hand cutting are secured, together with an accuracy unattainable in hand work. They are the only manufacturers who employ machinery for testing files and steel.

Goods of all known manufacturers have been repeatedly tested, and interesting tables have been compiled showing the working qualities of files made by different makers, and of files made from different steels, and with various shapes and angles of tooth. They have thus reduced the manufacture of files to an exactness and perfection with a uniformity of result, as they believe, never before attained. No file, foreign or domestic, that they have ever tested, has equalled the performances of their own goods taken at random from their stock. Their machines are capable of the most delicate adjustment, and can produce the very finest work known to the trade. Special files made to order. Prominent file manufacturers are having their best goods from our works. Price lists and information furnished on application.

AMERICAN FILE CO., Pawtucket, R. I.

Granted for



After more than Fourteen Years of Competition
McCaffrey's Philadelphia Hand Cut Files and Rasps
Have Proved their Great Superiority.

Superior Goods.



Silver Medal.



Messrs. ARNOLD & CO.,
310 California St., San Francisco,
Sole Agents for Pacific Coast.

Highest Premium.



AUBURN FILE WORKS,
Superior Hand-Cut
FILES AND RASPS,
MADE FROM IMPORTED STEEL. EVERY FILE WARRANTED.
FULLER BROS., Sole Agents,
89 Chambers and 71 Reade Streets, N. Y.

ESTABLISHED 1848.

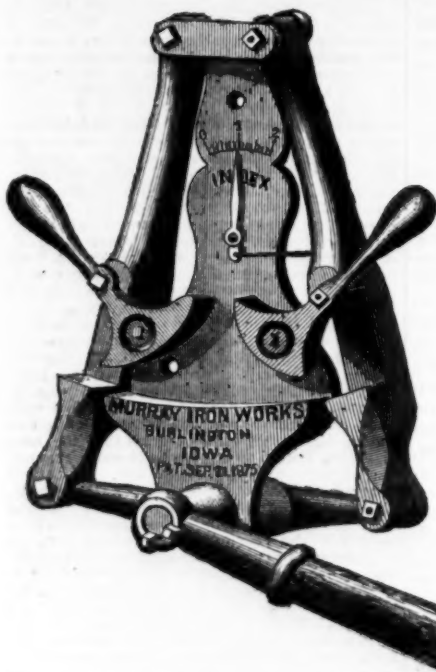
C. T. DRAPER & CO.
Sing Sing, N. Y.
Manufacturers of SUPERIOR
HAND CUT
FILES AND RASPS



MADE FROM BEST
ENGLISH CAST STEEL.
Quality guaranteed by written warranty
when required.

"INDEX" TIRE SHRINKER!

No. 3 Weighs 180 Pounds.—Price, \$25.



The most powerful and convenient Tire Shrinker ever offered to the trade.

The Anvil affords the means of welding the Tire or Bar while in the machine; an advantage possessed by no other Shrinker made.

One man (or boy) can work it alone! And it can be used equally well right or left handed.

The shrinkage is made in the most perfect manner, leaving the iron unmarked, the exact amount of shrinkage being shown by the index.

Adapted to light or heavy tire, and of any diameter.

These perfect Tools, in general use throughout the West, are made only by the

**Murray Iron Works
Company,**
BURLINGTON, IOWA.

GOLD MEDAL Non-Extensible Razor Belt.

PATENTED JULY 25, 1871.
RE-ISSUED MAY 13, 1873, and JUNE 9, 1874.

In this Strap the liability of the leather to stretch and become loose and porous is prevented by the use of a patented non-extensible base, which supports the leather and secures

PERMANENT ELASTICITY.

We make this strap with single rod, double rod, and wood frames, and intend that it shall, in quality and appearance, favorably with our other well known brands.

BENJAMIN F. BADGER & SON, Manufacturer
Badger Place, Charlestown, Mass.

HORSE RASPS AND FILES.



We invite the attention of the trade to our Celebrated American Horse Rasps and Files, made from the very best American Steel and cut by hand, and warranted to give entire satisfaction. All Rasps and Files not stamped as the annexed incorporated trade mark are not genuine. Sold by Hardware dealers generally.

Established 1838.

FILES & RASPS,
HAND-CUT. Manufactured by
JOHNSON & BRO.
No. 1 Commercial Street, Newark, N. J.

Established 1835. TRADE MARK ON

JOHN ROTHERY,
T.M. MATTEAWAN
N. Y. Horse Rasps,
John Rothery's
HAND-CUT FILES AND RASPS,
Made from English Cast Steel.

JOHN & WILLIAM ROTHERY,
Matteawan, N. Y.



Putnam's Government Standard
FORGED

**Hammer Pointed
HORSE SHOE NAILS,**
READY FOR DRIVING.

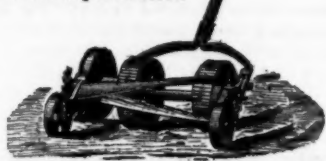
Manufactured from the best of NORWAY Iron, and warranted to give entire satisfaction.

S. S. PUTNAM & CO.,
NEPONSET, MASS.

THE IMPROVED (1877)

**Monitor
Lawn Mower.**

Simplest and Lightest Running Machine made.
Cutters of Tempered Steel.



AGENCY FOR
Machine Hardware Mfg. Co., Aquaria, Lawn
Settees, Flower Pot Brackets, Vases, &c., &c.
Sager, Ashworth & Co., Hand Made Files.
W. J. Clark & Co., Automatic Pencilblades.
S. H. & E. Y. Moore, Barn Door Hangers, &c.
C. H. Hoxie, Hammocks.
Wells Bros., Chas. Lehman, J. A. Scollay, Carl Deiterich, Bush & Smith, &c., &c.
Scroll Saws, Designs, Saw Blades, Fancy Woods, &c., &c.

Send for prices.
G. WEBSTER PECK,
Manufacturers' Agent for Hard-
ware Specialties.
110 Chambers St., New York.

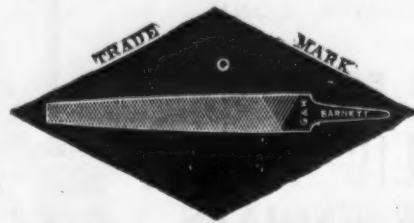
Tackle Blocks
Of all Description.
SHIP BLOCKS,
Well and Ships'
PUMPS.
Patent Pressed
PUMPLEATHERS'
Dealer in LIGNUMVITÆ WOOD.
JOSEPH THOMPSON,
Factory, 36 Burling Slip, 56 South St., N. Y.

LENNOX & PAINE
Manufacturers of
Iron, Brass & Steel Work.

Particular attention paid to Model Making.
Gear cutting for CLOCK WORKS, &c., a specialty.
55 Frankfort St., Cleveland, O.

Black Diamond File Works.

Send for illus-
trated Price List.



Send for illus-
trated Price List.

G. & H. BARNETT,

39, 41 & 43 Richmond St., Philadelphia.

St. Louis, Mo., SEMPLE & BIRGE MFG. CO., Agents.

THOS. TAYLOR, 43 Chambers St., N. Y., Agent for N. Y. and N. E. States.

THOS. JOWITT & SONS, SHEFFIELD,

Manufacturers of every description of

FILES.

Forged, Ground and Cut by
Hand and Tempered by an
Improved Process.

Manufacturers of
**CAST, SHEAR & BLISTER
STEEL**

For various purposes.

Granted according to Act of Parliament, and Registered in Germany and the United States.

Messrs. Russell & Erwin Mfg. Co.,
New York and Philadelphia.

Messrs. Quackenbush, Townsend & Co.,
New York.



**ROLLERS, TILTERS &
FORGERS.**

Importers of
**SWEDISH and RUSSIAN
IRONS.**

ESTABLISHED IN 1816.

NO CONNECTION WITH ANY OTHER HOUSE.

PETER A. FRASSE & CO.,

No. 95 Fulton Street, New York.

AGENTS for the American Screw Co.'s Machine Screws and Taps.

SOLE AGENTS Thos. Turner & Co.'s, Files, Horse Rasps.

" Hubert's French Emery Paper.

IMPORTERS OF STUBS' Files, Tools, Steel Wire.

" GROBET'S Fine Swiss Finishing Files.

" VAUTIER, NICOD and RENARD Gravers.

" JEWELERS' and Machinists' Supplies.

DEALERS IN Scroll Saw Machines, Bracket Saws, Wood and Patterns.

CHARLES B. PAUL,
Manufacturer of HAND CUT FILES.

Warranted CAST STEEL. 187 Tenth Street, Williamsburg, New York.

All descriptions of Files made to order. Price List mailed on application.

Established 1863.

AUSABLE HORSE NAILS
POLISHED OR BLUED.
HAMMERED AND FINISHED



The Ausable Nails

Are Hammered Hot,

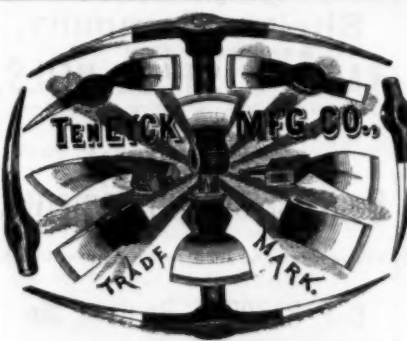
And the Finishing and Pointing are
Done Cold,

Thus Imitating the Process of Making Nails by Hand.

Quality is **Fully Guaranteed.**

For Sale by all Leading Iron and Hardware Houses.

ABRAHAM BUSSING, Secretary,
35 Chambers St., New York.



Ten Eyck Axe Mfg. Co
COHOES, N. Y.

Warehouse, 103 Chambers St., N. Y.

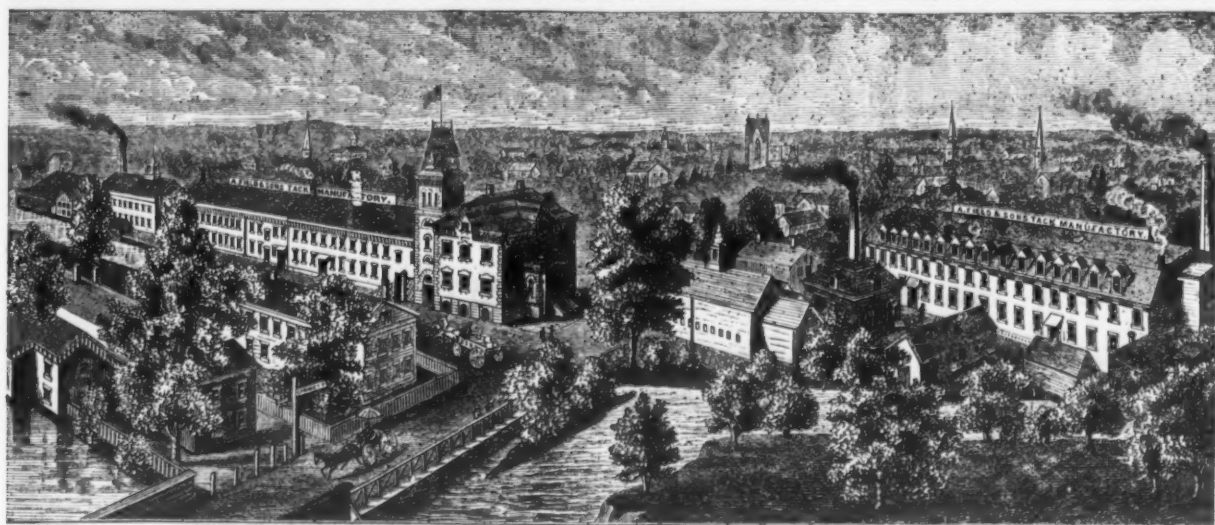
Manufacturers of

AXES

Of all kinds.

Hatchets, Adzes, Grub Hoes, Mat-
tocks and Picks.

Catalogues and Price Lists furnished upon ap-
plication.



A. FIELD & SONS,

TAUNTON, MASS., Manufacturers of
COPPER & IRON TACKS, TINNED TACKS,
 SUPERIOR SWEDS IRON TACKS, for Upholsterers' Use, Saddlers' Supply, Card Clothing, etc., etc.

American and Swedes Iron Shoe Nails,
 Zinc and Steel Shoe Nails, Carpet, Brush and Gimp Tacks, Common and Patent Brads, Finishing Nails, Annealed Trunk
 and Clout Nails, Hob and Hungarian Nails, Copper and Iron Boat Nails, Patent Copper Plated Tacks and Nails.
 Fine Two Penny & Three Penny Nails, Channel, Cigar Box & Chair Nails, Leathered Carpet Tacks, Glaziers' Points, Etc.
 OFFICES AND FACTORIES AT TAUNTON, MASS. WAREHOUSE AT 78 CHAMBERS STREET, N. Y.,
 where may be found a full assortment of Tacks, Brads, &c., for the accommodation of the New York Wholesale and Jobbing Trade.
 Any variations from the regular size or shape of the above named goods made from samples, to order.

Hoisting Machinery
 Manufactured by
 Crane Bros. Mfg. Co.,
 CHICAGO.
 COOKE & BEGGS, Agents, 16 Cortlandt
 Street, New York.

THE IRON CLAD Ice Balance.
 200, 300, 400 lbs.
 Capacity.
 CORRECT,
 COMPACT
 and
 DURABLE.
 NOT LIABLE TO GET OUT
 OF ORDER.
 Universally Approved
 BY THE
 Ice Companies.
 Manufactured only by
 John Chatillon & Sons,
 89, 91 & 93 Cliff St.,
 NEW YORK.

EUREKA SAFETY POWER!
 Practically impossible to
 explode. Tested to 500 lbs.
 pressure per square inch. Will
 lift 3 bushels corn per hour. Price
 \$25.00. Also, Stationary Engines
 and Boilers and Spark Arresting
 Portable Engines for
 plantation use. Send for our cir-
 cular. Discount to the trade.
 B. W. PAYNE & SONS,
 Corning, N. Y.

SILVER'S
 Waste Heat Utilizer and Ventilator.
 Is the problem solved? How to utilize waste heat
 from chimneys, establishing a system of warming
 and ventilating, based upon sound philosophy and
 economy. This apparatus requires less fuel when
 the room is ventilated than if not ventilated, a fea-
 ture heretofore unknown in the history of heating
 appliances. For circulars and illustrations address
 L. B. SILVER, Cleveland, O.

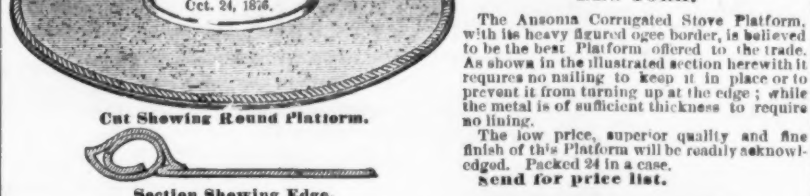
PRIZE MEDALLISTS:
 London, 1862; Oporto, 1865; Dublin, 1865; Paris,
 1867; Moscow, 1873; Vienna, 1873, and only
 Award and Medal for Self-Coiling Steel
 Shutters at Centennial Exhibition,
 Philadelphia, 1876.

CLARK & CO.,
 ORIGINAL INVENTORS AND SOLE
 PATENTEES OF
 Noiseless Self-Coiling Revolving
STEEL SHUTTERS,
 FIRE AND BURGLAR PROOF.

Rolling Wood Shutters
 Of various kinds. Clark's Shutters are the Best
 and Cheapest in the world. Are fitted to new
 Tribune Building, Lenox Library, Delaware and Hud-
 son Canal Co.'s Building, Transatlantic Steamship
 Co.'s new Dock, American News Office, &c., Posey
 County Court House, Mt. Vernon, Holt County
 Court, Oregon, Mo. Also to buildings in Boston,
 Cincinnati, Detroit, Janesville, Wis., Baltimore,
 Canada, &c. Have been for years in daily use in
 every principal city throughout Europe, and are in-
 dorsed by the Leading Architects of the
 World.
 Office and Manufactory,
 162 & 164 West 27th Street, N. Y.

ANSONIA CORRUGATED STOVE PLATFORM

Manufactured by the
Ansonia Brass & Copper Co.
 Office, 19 & 21 Cliff Street,
 NEW YORK.



ANSONIA
Bronzed Fire Screen,
 With Ornamented Mouldings.
 PATENT APPLIED FOR.

The Portable Bronzed Fire Screen or
 Shield, as shown in the illustration, is especially
 designed for the safety and protection of walls, fur-
 niture, woodwork, paper or varnish from heat.
 Being constructed of metal, with firm and substan-
 tial edges, curved in form to stand alone, it may be
 easily adjusted to any position about a stove, before
 a grate or fire place. The demand for something
 useful, durable and ornamental as a Fire Screen has
 long been felt, and having finally accomplished the
 desired result, we are prepared to fill all orders
 promptly.

H. A. ROGERS,
 BOX 4106. 19 John Street, NEW YORK.

SUPPLIES, in every variety,
 For Railroads, Mills and Manufacturers.

Send for new Illustrated Catalogue, 272 pages.
STANLEY RULE AND LEVEL CO.,
 Manufacturers of IMPROVED CARPENTERS' TOOLS.



No. 123, Fore Plane, 30 inches in length. 2 1/2 inch Cutter. \$2.25.

LIST PRICES REDUCED.
DARLING, BROWN & SHARPE
 Providence, R. I.

MANUFACTURERS OF
United States Standard Steel Rules,
HARDENED CAST STEEL TRY SQUARES,
STANDARD WIRE GAUGES,

AND
TOOLS FOR ACCURATE MEASUREMENTS.

New Illustrated Catalogue, issued March 1, sent per mail
 on application.

The Australian Exhibition.

The Boston Commercial Bulletin publishes the following extract from the letter of a cor-
 respondent in Sydney, written May 4th:

"Contributors from the United States and
 Canada are disgusted at the treatment their
 exhibits have received at the hands of the In-
 tercolonial Exhibition at Sydney. Boxes of
 machinery and implements have been knocked
 open, and contents scattered, no one knowing
 the *modus operandi* of putting them together—
 shelterless in the greater part. Machinery,
 dry goods, &c., were all put into a building
 not water-proof, and consequently became
 completely soaked with heavy rains which hap-
 pened to fall the last week. The question will
 arise, Who pays the damage? To say that the
 exhibitors are 'mad,' but half expresses it,
 especially when they think of the inducements
 held out in Philadelphia."

From a letter to the Times, written on the
 same day, May 4th, we conclude that the Bul-
 letin correspondent has drawn on his imagi-
 nation for facts. The Times correspondent says:

"The buildings erected for the Exhibition
 stand in Prince Alfred Park, so named in honor
 of a visit paid to the colonies in 1858 by the
 Queen's second son. They were opened on the
 day above named, with the majestic simplicity
 which becomes a democratic community. The
 Governor, the importance of whose office may
 be measured by the amount of his salary,
 £7,000, or \$35,000, and the fact that he holds his
 commission direct from the crown, drove
 through the main streets of the city, from his
 residence on the picturesque shores of the
 harbor to the entrance gates at the grounds,
 where he was received by the Commissioners.

Sometimes in public displays it is customary
 to muster a considerable military force, and
 fire off a number of cannon. A portion of the
 troops then act as an escort and guard of
 honor. The clatter of swords and the splendor
 of the uniforms call the attention of the street
 walkers to the fact that the representative of
 the Queen is on a progress through the city,
 and they fetch householders in thousands to
 the windows. On this occasion the symbols of
 peace were alone resorted to. No doubt the
 attendance of visitors from abroad was too
 small to render a martial display necessary.
 Had there been any representatives of Russia—
 a country which looms up largely in the imagi-
 nation of the colonists whenever they speculate
 on the likelihood of invasion—probably both
 regular troops and volunteers would have been
 called out, and the ceremonies made as im-
 pressive as the modest stock of arms and am-
 munition in the possession of the government
 would have permitted. A short address was
 delivered by the Governor and the Exhibition
 pronounced open. To the visitor abundant
 proof was given of the richness of the colonies
 in cereals, wools and minerals. Most of the im-
 plements of husbandry are locally made or im-
 ported from Europe. Plenty of room exists
 for the introduction of improvements. For
 years colonial inventors have vainly puzzled
 themselves with attempts to construct auto-
 matic reapers and binders, but the only ma-
 chine on exhibition comes from the United
 States.

"Though contributions were solicited from all
 the colonies, Queensland and Tasmania are the
 only two which have sent special collections.
 The commodities of American make which
 are most likely to sell well in Australia are
 those in which iron, wood or cotton form the
 principal constituents. Both iron and coal are
 abundant in Australia, but the latter mineral
 is the only one which the colonists have yet
 learned to mine on a large scale successfully.
 Though timbers are plentiful, and the forests
 stand in close proximity to the coast, the rivers
 or the railroads, they are mostly hard and
 heavy. Pines such as the white of the Atlantic
 States or the red of the Pacific States of
 America are represented by species of inferior
 quality, and the markets depend largely on for-
 eign supplies. To America the colonists appear
 inclined to look for useful hints on the im-
 provement of railway traffic, and in the con-
 struction of bridges of moderate cost, and in
 the introduction of rationally built carriages
 or cars, drawn by moderately expensive loco-
 motives. Close imitations of the models of
 English engineers, who seldom allowed econo-
 my to restrict enterprise, has led the colonists
 into many needless extravagances. The speci-
 mens of locomotives and cars procured from
 the States by the government in some cases
 and sent hither by exhibitors and others, may
 be expected to serve as finger posts to direct
 the people on the road to reform. The rail-
 ways here are splendid samples of solid work-
 manship, but had they not been undertaken by
 the government it is doubtful if the money
 they have cost—in some cases \$150,000 a mile—
 could have been raised by public companies."

"The Exhibition has had the effect of giving
 great prominence to American and Canadian
 manufactures, and of removing those prej-
 uices and misconceptions which naturally
 enough obtain a hold upon the minds of a com-
 munity so remote from the civilized nations of
 the Northern Hemisphere as is Australia. This
 is the first step toward trade; and it is only
 necessary that the manufacturers of America
 and the merchants of Australia should get bet-
 ter acquainted in order that permanent business
 intercourse may be established. Upon the re-
 turn of more prosperous times in America,
 when your business men again get leisure to
 travel, it may be worth their while to take a
 trip across the Pacific and ascertain for them-
 selves what is the business outlook here. The
 agents of Canadian houses have booked some
 large orders for woolen goods, and in several
 lines of American articles the few samples sent
 to the Exhibition have been sold at prices
 which I presume are satisfactory to the sellers.
 On the other hand, it is quite likely that some
 exhibitors here act goods unsuited to the
 Australian markets, and for which there is little

or no demand, while others, such as 'chal-
 lenge blacking' and 'sugar coated pills,'
 seem to be scarcely in place in an exhibition
 of the kind. New South Wales imports American
 goods to the extent of \$250,000 annually, but
 there are also many shipments of edge tools
 and other articles of United States manufac-
 ture which come to us from Great Britain, and
 are not, therefore, included among the imports
 from the States.

"The large collection of cotton goods sent to
 the Exhibition by Mr. R. W. Forbes, of New
 York, are about the first samples of American
 manufacture in that line which have come into
 the Australian market. Our supplies have
 hitherto been exclusively from England; but
 if the cotton manufacturers of Massachusetts
 can beat those of Manchester on their own
 ground, there is no reason why they should
 not participate in the trade which must always
 exist in this hemisphere for goods of that class.
 It is important that they should ascertain the
 widths and styles of goods for which there is
 an established demand here, for it is not likely
 that any others would be salable however great
 their intrinsic excellence as regards material
 and manufacture. Our importations of cotton
 goods from England amount to about £300,000
 a year, but the total value of the Australian
 and New Zealand imports in that line would
 approach very nearly £1,000,000 per annum.
 Cotton will grow on the northern rivers of New
 South Wales, but there are a score of other
 things which pay better, and hence cotton
 growing here is as little practiced as in Alaska.
 In Queensland more persistent and systematic
 efforts have been made to grow cotton, but
 with very little better results.

"Canada has sent us a good deal of ready-
 made clothing and boots and shoes. This is
 very like sending coal to Newcastle, or oysters
 to Baltimore. In all of our large cities the
 manufacture of shop clothing is extensively
 carried on, and we have leather and boot fac-
 tories in operation on the most extensive scale.
 The only sorts of boots imported into Australia
 are of the finer descriptions for women's and
 children's wear; but it happens that the broad-
 soled men's boots, and the boots with uppers
 reaching above the ankles for ladies and
 children, are not worn here, so that unless
 there should be some radical change in the
 fashions, importations of existing styles of
 American boots are not likely to be remunera-
 tive.

"Several American and Canadian firms show
 nails, nuts, bolts and metal work required for
 carriages and wagons, and there has been a
 very good exhibit of Canadian carriages. Most
 of these, I am told, have found purchasers.
 There is no city in Australia, and very few any-
 where else, where in proportion to the popula-
 tion there are so many handsome and well ap-
 pointed private carriages, but then these are
 chiefly made in the colony, and our total im-
 portations from Great Britain and the United
 States are less than £10,000 a year. The few
 vehicles we obtain from America, chiefly Ab-
 bott's buggies, are imported because of the
 superiority of the timber used in them, but the
 expectations which Canadian carriage builders
 appear to entertain of doing a large export
 business with Australia are not likely to be
 realized. Any commerce which will spring up
 will be in carriage materials, and not in the
 ready-made article. Our own artisans have
 little or nothing to learn in the way of skill;
 and although in New South Wales there are
 scarcely any import duties, still the freight is,
 in itself, a sufficient protection to the Aus-
 tralian workman against competition by the
 cheaper labor of other countries.

"The Australian markets for edge tools, ax
 handles, &c., are almost wholly supplied from
 the United States, and the value of the direct
 importations of New South Wales exceeds
 £30,000 a year. The actual value of the trade
 is probably greater, if there were any means
 of ascertaining the amount of the indirect im-
 portations through English houses. Among
 the American firms represented here, chiefly
 through Messrs. R. W. Cameron & Co., of New
 York, are Messrs. Collins & Co., New York;
 Messrs. Lane & Gale, of Troy, N. Y.; the Ten
 Eyck Company, Messrs. Weede & Becker, Mr.
 Barton and others. Messrs. Disston & Sons,
 of Philadelphia, have sent us the best collec-
 tion of saws which has yet been exhibited, and
 from all I can learn Philadelphia has every
 chance of competing with Sheffield.

"There are several good exhibits of locks and
 door furniture, and my attention was particu-
 larly struck with a very handsome lot of goods
 sent by Messrs. Mallory, Wheeler & Co.,
 through Mr. R. W. Forbes, of New York, who
 is largely concerned in the direct American
 trade to this port. Not having made any in-
 quiry as to the prices, I am unable to say how
 goods of this class compare in this particular
 with those which come to us from Great Britain.
 They may not be as cheap, but they are certain-
 ly much better than the heavy and clumsy
 goods which have generally been sent to this
 market; and unless our English makers im-
 prove upon their handiwork, I fear their occu-
 pation will soon be gone.

"There are several exhibits of oil cloths for
 tables and floors. The patterns of the latter
 are generally smaller and brighter in color
 than the English floor cloths, and they are
 not so heavy. The patterns of the table
 cloths are varied to choice, but the texture of
 many of them is of rather a low grade. The
 wall papers and window blinds are very good.
 There are no patterns of the inside wooden
 blinds so common in America, nor do I think
 that any have yet been introduced. They are
 just the very thing for this sunny climate, and,
 if I mistake not, can be supplied at a cheaper
 rate than the Venetian blinds now in use,
 these latter being very fragile, as well as ex-
 pensive.

"Kerosene lamps and lampware are shown
 [Continued on page 11.]

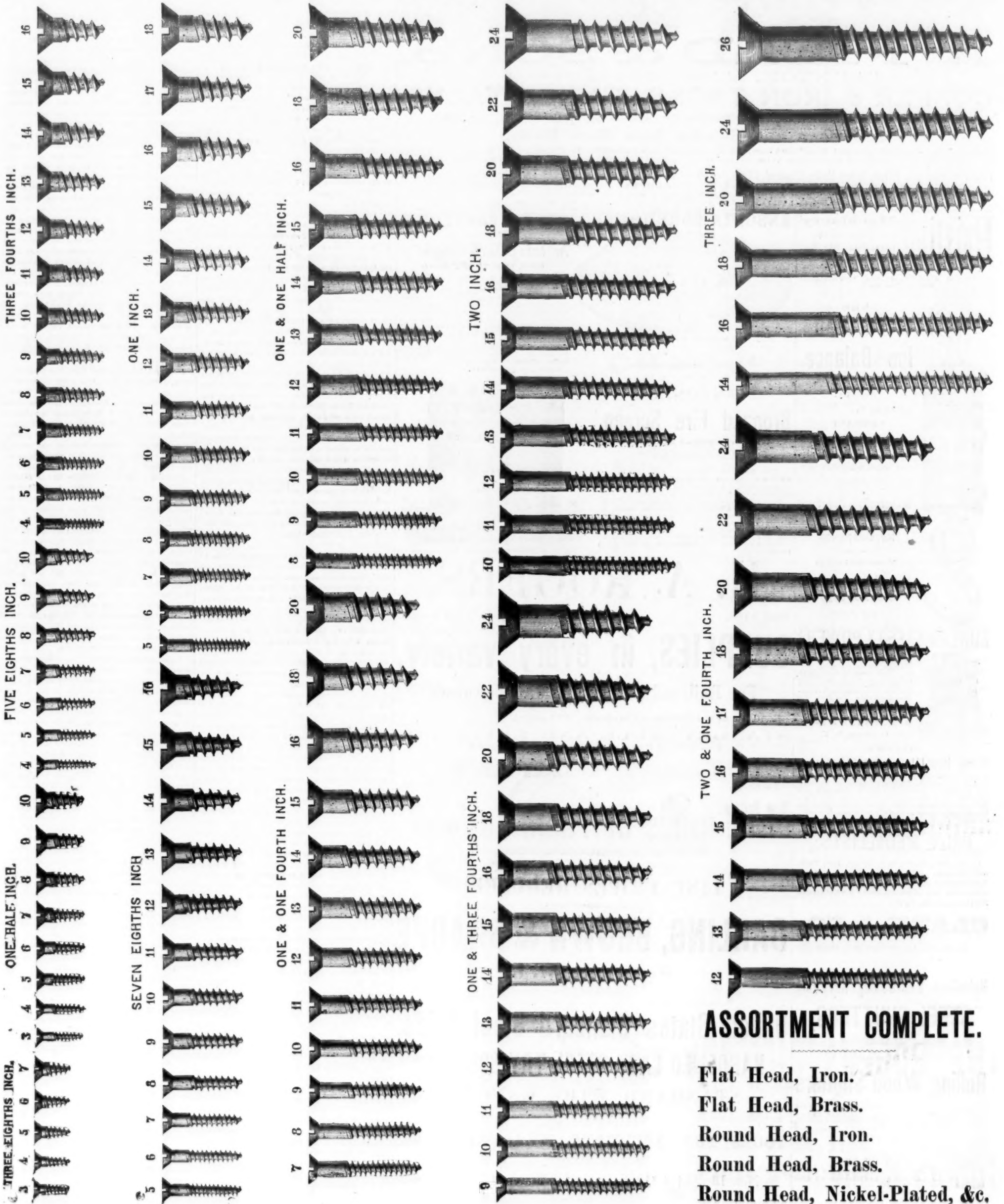
RUSSELL & ERWIN MANUFACTURING COMPANY

Manufacturers of HARDWARE.

FACTORIES, - - - NEW BRITAIN, CONNECTICUT, U. S. A.

MANUFACTURERS' AGENTS AND DEALERS IN GENERAL HARDWARE AT OUR

WAREHOUSES: NEW YORK, 45 & 47 Chambers St.; PHILADELPHIA, 425 Market St.; SOUTHERN DEPARTMENT, BALTIMORE, MD., WM. H. COLE. Agent, 17 S. Charles St.



Cutlery.

FRIEDMANN & LAUTERJUNG,



Manufacturers of PEN AND POCKET CUTLERY.

Solid Steel Scissors, Shears, Razors,
Russia Leather Straps, Hones, &c.

Sole proprietors of the renowned full concave patent

"ELECTRIC RAZORS,"

And the celebrated "ELECTRIC SHEARS." Nickel Plated
Hones.

Agents for the BENGALL RAZORS.

AMERICAN TABLE CUTLERY, BUTCHER KNIVES, &c.

91 Chambers and 73 Reade Sts., N. Y. 423 N. Fifth St., ST. LOUIS, MO.

MERIDEN CUTLERY CO

THE "PATENT IVORY" HANDLE TABLE KNIFE.

MANUFACTURE ALL KINDS OF TABLE CUTLERY.

EXCLUSIVE MAKERS OF THE

"PATENT IVORY" OR CELLULOID KNIFE.

The most Durable WHITE HANDLE known. THE OLDEST MANUFACTURERS
IN AMERICA. Original Makers of The Hard Rubber Handle.Always call for "Trade Mark" "MERIDEN CUTLERY
COMPANY" on the blade. Warranted and sold by all Dealers
in Cutlery, and by the MERIDEN CUTLERY COMPANY, 49 Chambers Street, New York.

The Miller Bros. Cutlery & U. S. Steel Shear Co.'s "Consolidated."

Centennial Award for best Quality and Finish.



Pocket Cutlery and Solid Steel Shears and Scissors.

J. C. WILSON & CO., 81 Beekman St., New York Agents.

E. L. COOPER, 48 Warren St., New York Special Agent.

THE MILLER BROS. CUTLERY CO., West Meriden, Conn.

NAUGATUCK CUTLERY CO.,

Manufacturers of FINE PEN & POCKET CUTLERY.

FULLER BROS., Sole Agents, 89 Chambers and 71 Reade Sts., N. Y.

HALL, ELTON & CO.,

Electro Plated Ware, German Silver and Britannia Spoons.



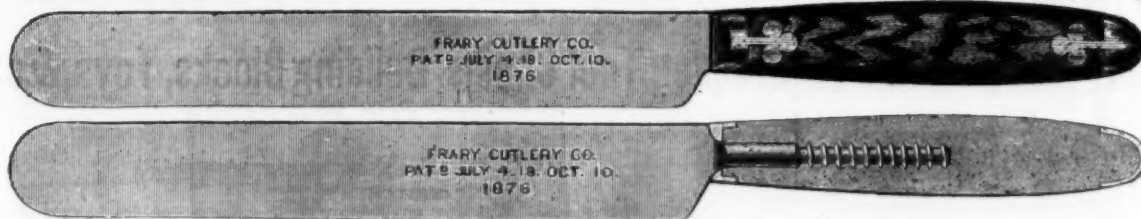
Factories, Wallingford, Conn.

Salesroom, 75 Chambers Street, New York.

THE FRARY CUTLERY COMPANY,

FACTORY, Bridgeport, Conn. NEW YORK OFFICE & WAREHOUSE, No. 83 Chambers St.

Manufacturers of all kinds of Table Cutlery.



The above illustrations represent their New Patent Screw Tang Lock Fast Solid Handle Knife.

There is no question but that a solid handle Knife is much more preferable than a scale tang. The great objection to their use hitherto is, that no solid wood handle has been placed on the market with the handle properly secured—no handle put on with cement will stand the wear and tear of every day usage. The cement will expand and contract with the action of heat and cold, and become loose, crack and come off, causing great prejudice against their use. This objection is overcome in our patent screw tang. A wood screw is welded to the tang of the Knife or Fork, and screwed firmly and securely in the handle and locked there by the bolster, making a very strong neat and handsome knife, which we warrant never to get loose, crack or come off. We manufacture a large variety of patterns, both Table, Butchers and Carvers, and furnish the patent handle nearly as low as the scale tang. We are prepared to furnish this line of goods, together with the scale tang and iron handle, very promptly, and very respectfully invite the attention of the trade.

THE ROGERS CUTLERY CO.,



MANUFACTURERS OF

Cutlery & Silver Plated Goods.

P. O. Box 204.

HARTFORD, CONN.

Cutlery.

ESTABLISHED 1852.

NEW YORK KNIFE CO.

MANUFACTURERS OF SUPERIOR

Table & Pocket Cutlery,

WARRANTED TO BE MADE OF THE BEST

MATERIAL.

WALKILL RIVER WORKS,

Walden, Orange Co., New York.

THOS. J. BRADLEY, President.



Young's Patent Folding Scissors.



Fac simile of the small size.

These Scissors are made of the very best steel, nickel plated, and so constructed that they can be readily folded and carried in the pocket without injury to the garments. A sample pair will be sent by mail, to the trade only, upon receipt of the retail price, namely: For small size, either blunt or pointed, \$1.00; For large size, pointed or half pointed, \$1.50. New York, Feb. 1st, 1876.

MARX BROS., Proprietors, 450 Broadway.

AMERICAN

PEN AND POCKET KNIVES,

MANUFACTURED BY



PEPPERELL, MASSACHUSETTS

My Blades are forged from the best Cast Steel, and warranted. To me was awarded the GOLD MEDAL of the Connecticut State Agricultural Society; also a silver and Diploma from the Mass. Mechanics' Ass'n Sept., 1876.

Established 1853.

AMERICAN SHEAR CO.

Manufacturers of

Pen and Pocket Cutlery,

Shears, Scissors and Pruning Shears,

HOTCHKISSVILLE, CONN.

Salesroom, 298 Broadway, New York, with

LANDERS, FRARY & CLARK.

Cutlery.

JOSEPH S. FISHER,

No. 411 Commerce St., PHILADELPHIA

AGENT FOR

George Wostenholm & Son,

Washington Works, SHEFFIELD,

Celebrated I-XL Cutlery, Razors, &c

"Limited."

AGENT FOR

WALTER SPENCER & CO.,

Steel and File Manufacturers,

Rotherham, ENGLAND.

Corporate Mark



Granted 1777.

F. W. HARROLD,

Birmingham and Sheffield,

ENGLAND.

Importer on Commission

HARDWARE, CUTLERY, GUNS, &c.

W. SANDERS, Agent, 76 Reade Street, N. Y.

CORPORATE MARK,



Joseph Rodgers & Sons' (LIMITED)

CELEBRATED CUTLERY,

No. 82 Chambers Street, New York.

F. & W. CLATWORTHY, Agents.

The demand for Joseph Rodgers & Sons' productions having considerably increased, they have, in order to meet it, greatly extended their Manufacturing Premises and Steam power.

To distinguish Articles of Joseph Rodgers & Sons' Manufacture, please to see that they bear their Corporate Mark.

VAN WART, SON & CO.

Hardware Commission Merchants,

EXPORTERS AND IMPORTERS,

BIRMINGHAM, - ENGLAND,

Agents,

McCOY & COMPANY,

184 & 186 Duane Street, N. Y.

George H. Gray & Danforth,

48 India Street, Boston.

F. W. TILTON,

17 Old Levee Street, New Orleans.

At each of these places a complete assortment of samples of Hardware and Fancy Goods will be found, including all new descriptions. Sole Agents for John Rimmer & Son's Celebrated Harness and other Needles.

W. Clark's Genuine Horse Clippers.

Seydel's "Ashantee" Pocket Hammer.

McCOY & COMPANY, BORAX A SPECIALTY, 134 & 136 Duane St., New York.

OWEN & CAMPBELL,

Manufacturers of

Pen and Pocket Cutlery.

All blades forged from the best English Cast Steel and warranted. Each Knife is made in the most substantial and compact manner, all articles used being of the best quality. Orders filled from the Factory, 10th & Diamond Sts., Philadelphia.

ALFRED H. HILDICK,

12 Warren St., N. Y., Importer of

Birmingham Heavy Hardware, Chains,

Anvils, Vises, &c.

Agency of HILL BROS. & CO., WALSALL, ENGLAND,

GENERAL HARDWARE MERCHANTS,

And of

Ball's Pat. Solid Steel Sheep Shears.

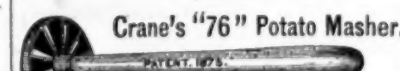
These Shears are unsurpassed for cheapness, durability and utility. They are made of one solid piece of steel from point to point, and cannot be broken in use, either in the bow or at the junction of back and blade. Samples can be seen at above address, or sample lots furnished. Depot for "THE CROWN" SOLID BOX VISES. A cheap and excellent Vise.



Sold by the hardware trade.

"DRAW CUT" BUTCHER'S MACHINES. Choppers, Hand and Power. Stuffers, Lard Presses. Warranted thoroughly made and the BEST IN USE.

MURRAY IRON WORK Burlington, Iowa.



Efficient, durable, and easily cleaned. Supplied to the trade only. Samples sent free to responsible houses. Agents wanted in every State. Send for illustrated circulars and price list to ROBERT CRANE, Jr., Columbia, Lancaster Co., Pa.

Clinton Wire Cloth,

4 1/2 c. Square Foot,

A. A. IRVINE,

14 Murray St., New York.

P. O. Box 3094.

[Continued from page 9.]

The Australian Exhibition.

by two or three firms; and I think it likely that the chimneys made of flint glass, which are here pretty much of a novelty, would be in great demand if procurable of the requisite sizes and shapes. Many of the improved American kitchen utensils are yet but very imperfectly known in Australia; and the washing machines, for which there is likely to be a great demand in a country where domestic servants are not to be got for love or money, shown at the Exhibition, were not of the best descriptions.

"Fairbanks & Co., make a splendid exhibit of scales, and Mr. Fay, of Cincinnati, Ohio, has sold his wood working machines.

"In the fine art department Rogers' (of New York) terra cotta statuettes have elicited very much admiration; and so also have a number of chromos from the establishment of Messrs. L. Prang & Co., of Boston, Mass., sent to the Exhibition by a Sydney print seller. Lieut. M. Wheeler, of Washington, and Prof. F. O. Hayden, in charge of the surveys of the frontier have also contributed very numerous and handsome collections of photographs taken in Colorado—the Yellowstone and the Western territories. As specimens of artistic photography they are extremely interesting, but they possess a much higher scientific value.

"The Exhibition has now been open nearly a month. For the first fortnight we had most delightful weather, and an aggregate attendance of over 125,000. Since then cold winds and heavy rain, which indicate the near approach of winter, have set in, and the attendance has dwindled down to very insignificant dimensions. It is, perhaps, premature to speculate upon the result of the Exhibition from a commercial point of view. It is quite possible that some exhibitors from abroad have not found it remunerative; but immediate profit is probably more than would be expected by those who have ventured upon the experiment with a view to lay the foundation of a future and growing trade. Whatever may be the pecuniary results to individuals, I think there can be little doubt that this exposition of American and Canadian manufactures has done much to educate the public mind and prepare the way for future commerce."

A New Use for Sand.—The incompressibility of sand is suggested to the *American Journal of Industry* as a cheap and ready means of making supporting columns and bases for anvils, or for blocks designed to support heavy weights. Sand inclosed in thin wooden or iron walls, if thoroughly shaken down, may be made to sustain a much greater weight than the walls or cylinders alone, by placing all the weight directly on the sand and quite free from the walls that retain it. Wooden boxes filled with sand thus make excellent supports for anvils or tables for laboratory work. So long as the pressure is vertical, the sand will sustain far greater weights and resist heavier blows than could be borne by solid blocks of wood of the same size.A Bessemer Bell.—The *Bethlehem Times* says probably the first Bessemer steel bell ever cast now hangs in the belfry of the Presbyterian church in that borough. This bell was cast in the Bessemer works of the Bethlehem Iron Company, and weighs but 53 pounds. Its tone is clear and pleasant.The Philadelphia *Ledger* says: In years gone by Birmingham supplied the world with hardware. Now she cannot supply her customers with certain classes of the very goods in which she formerly had a monopoly unless she tells them that the goods come from America. We hope Birmingham really does buy them of us. It is Australia and Canada that are chiefly demanding American goods in the hardware line, and not an infrequent thing is the shipment of our hardware to England to be at once reshipped to Australia. The people of those far off colonies learned something at the Centennial Exposition, but it takes time to get trade to take new channels, so that we cannot expect a heavy direct trade with this country to spring up at once, although the shipments of cargoes direct from the United States to Australia are becoming more and more frequent. It is said to be the regular custom now of one large Birmingham house to buy annually \$150,000 worth of hardware in the United States to send to Australia. Heretofore, the railroad iron of the world outside of this country has generally been supplied by England. But now the British ironmasters are astonished at finding a Pennsylvania house the lowest bidder for a contract to supply rails to Brazil. We are also told of constantly increasing shipments of American boots and shoes to the rural districts of England, where they find a ready sale on account of their cheapness and neatness of appearance.

A Florida paper mentions a new use to which cotton seed has recently being put that is of no little import. It is in the shape of a non-conducting cover for steam boilers, and is described thus: "It is the cortical part of the seed with the little fuzz attached that is used. A layer of these cotton seed hulls is put around the boiler with the aid of slate, and then the whole is covered with a layer of plastering. With 25 pounds of steam on the surface of this casing it was barely warm; and we are assured that both in the engine and fire rooms the temperature has been greatly reduced, so as to be much less oppressive, since the casing was put on. This seems to be something entirely new, and though in the present instance it is highly satisfactory, the party who tried it thinks he can suggest some improvement so as to render the non-conducting of heat still more perfect."

The Iron Age.

New York, Thursday, June 21, 1877.

DAVID WILLIAMS - Publisher and Proprietor.
JAMES C. BAYLES - Editor.
JOHN S. KING - Business Manager.

RATES OF SUBSCRIPTION, INCLUDING POSTAGE.

IN THE UNITED STATES, BRITISH AMERICA AND SANDWICH ISLANDS.

Weekly Edition.....\$4.50 a year.
Issued every THURSDAY morning.
Semi-Monthly Edition.....\$2.50 a year.
Issued the First and Third THURSDAY of every month.
Monthly Edition.....\$1.15 a year.
Issued the First THURSDAY of every month.
Remittances may be made at our risk by post office money order, draft on a New York or Philadelphia bank, or in a registered letter.

TO FOREIGN COUNTRIES.

	Weekly.	Semi-Monthly.	Monthly.
Mexico.....	\$5.50	\$3.25	\$1.50
West Indies (all the Antilles).....	5.00	2.50	1.25
South America (except Brazil).....	8.00	4.00	2.00
Brazil.....	6.50	3.25	1.50
Europe.....	6.00	3.00	1.50
Australasia.....	5.00	2.50	1.25
Asia-India and East Indies.....	8.00	4.00	2.00
Japan.....	6.00	3.00	1.50
China.....	5.00	2.50	1.25
Other Countries.....	6.00	3.00	1.50

ADVERTISING.

One square (12 lines, one inch), one insertion, \$2.50; one month, \$7.50; three months, \$19.50; six months, \$35.00; one year, \$65.00; payable in advance.

DAVID WILLIAMS, Publisher,
83 Reade Street, New York.

WESTERN OFFICE.

77 Fourth Avenue, Pittsburgh.
JOS. D. WEEKS, Manager and Associate Editor.

PHILADELPHIA OFFICE.

220 South Fourth Street.
THOS. HOBSON, Manager.

BRITISH AGENCY.

The publishers of *The Iron Age*, 44a Cannon Street, London, England, will receive orders for subscriptions and advertisements on our regular terms.

AUSTRALIAN AGENCY.

The American Hardware Company are our agents for Australia. They will exhibit files of *The Iron Age* in the American Building of the International Exhibition, at Sydney, N. S. W., where subscriptions will be received. After the close of the Exhibition, the files may be examined at, and orders for subscription directed to, their office in Melbourne. Sample copies will be mailed by them, free of charge, to any firm engaged in the trades we represent in Australia, Tasmania and New Zealand.

City subscribers will confer a favor upon the Publisher by reporting at this office any delinquency on the part of carriers in delivering *The Iron Age*; also, the loss of any papers for which the carriers are responsible. Our carriers are instructed to deliver papers only to persons authorized to receive them, and not to throw them in hall ways or upon stairs; and it is our desire and intention to enforce this rule in every instance.

CONTENTS.

First Page.—A New Harvester and Binder. Patent Wrought Iron Shear. A Village of Nail Makers. The Vulcan Iron and Nail Works. Conservatism of English Manufacturers. Why the Roumanian Railways are Crooked. Rhode Island Manufactures.
Third Page.—Salt in Iron Manufacture. The Molders' Union and Discharged Convicts.
Fifth Page.—New Patents. Business in Ancient Pompeii. The Mineral Resources of Canada.
Seventh Page.—The Mineral Resources of Canada.—(Continued.)
Ninth Page.—The Australian Exhibition.
Eleventh Page.—The Australian Exhibition.—(Continued.) A New Use for Sand. A Bessemer Bell.
Thirteenth Page.—Is a Reduction of Iron Production Advisable and Practicable? The New German Patent Law. The Decline in Lead. The Fast Trains Again. The Mollie Maguires.
Fifteenth Page.—The National Association of Stove Manufacturers. Scientific and Technical Notes.
Sixteenth Page.—Industrial Items.
Eighteenth Page.—Industrial Items.—(Continued.)
Twentieth Page.—Russell's Patent Parallel Pillers. The Ore Trade on the Western Lakes.
Twenty-first Page.—Trade Report. Mining Stocks. General Hardware. British Iron Market. Iron. Metals. Exports. Imports. Coal.
Twenty-second Page.—Coal.—(Continued.) Old Metals. Paper Stock. &c. Philadelphia. Pittsburgh. Boston. St. Louis. Baltimore. Richmond. Louisville. Cleveland. Chattanooga. Foreign.
Twenty-third Page.—Foreign.—(Continued.) Our English Letter. The New Patent Law of the German Empire.
Twenty-fourth Page.—The New Patent Law of the German Empire.—(Continued.)
Twenty-fifth Page.—New York Wholesale Prices of Hardware and Metals.
Twenty-sixth Page.—New York Wholesale Prices.—(Continued.)
Twenty-seventh Page.—Philadelphia, Buffalo, Chicago and Pittsburgh Hardware and Metal Prices.
Twenty-eighth Page.—Boston and St. Louis Hardware and Metal Prices.

Is a Reduction of Iron Production Advisable and Practicable?

There is a well defined and active movement in progress looking to the reduction of production at the rolling mills of the country and in the heavier classes of iron manufacture, especially those which are but one remove from the rolls, such as nails, iron pipe, etc. The Atlantic States Nail Association has for some months past, by vote, reduced its production from month to month, the average production for the past six months being, perhaps, 60 per cent. of the capacity of the mills. The rules of the Western Nail Association require unanimous consent to a stoppage, and it has taken no formal action on the question. Still its reports show a production during the past six months of about 66 2/3 per cent. of capacity. As has already been announced, the lap-welded pipe manufacturers had a long session at Philadelphia when the question of suspending came up, and was lost by one vote, it requiring a unanimous vote to suspend. At the concluding session, however, it was agreed to postpone the consideration of the matter until co-operation could be secured with the other branches of the pipe trade, especially the manufacturers of butt-welded pipes.

In the general rolling mill business it is well known that there has been a large reduction of production, arising from various causes, partly from a decreased demand and partly from the large reduction in price consequent upon this decreased demand, and the urgency of some mills to sell. Just what this decrease has been it is impossible to say, but it must be much larger than that in nails.

But notwithstanding this reduction, one thing is painfully evident—it has neither helped the trade nor increased the price. On the other hand, it has injured the trade and been powerless to prevent a large reduction in price. The fact that some of the best and strongest manufacturers in some of the classes mentioned above have stopped production, or at least refused to quote, and only sell to certain houses whose trade they wish to keep, has led to a feeling on the part of buyers, often without foundation, that the financial necessities of the mills or factories compelled those running to continue in operation, and so in this way a reduction of production has been injurious. Its effect, or, rather, lack of effect, in keeping prices up, is very marked. The first of December nails were quoted in New York at \$2.90 for 10d., firm. The quotation in our last issue was \$2.40, weak. In the West they were quoted at \$2.75 in December, and in our last issue \$2.50. Bar iron was quoted December in Philadelphia at \$1.90 to \$2.10 for ordinary brands; now, \$1.75 to \$1.90. In December, at Pittsburgh the quotations were \$1.90 to \$2; now, \$1.70 to \$1.80.

We think the facts given amply prove two things: First, that the reduction of production as accomplished has had a demoralizing effect on the trade. Second, it has failed to prevent a reduction in price, but a reduction has come in spite of it.

Just here the question arises, Why has this been so? We answer, partly because the reduction has not been so great as it should. That is, it was not continued to the point of scarcity. These products have been either abundant, or at least easy to get; manufacturers have been begging for orders, instead of buyers for goods, and the good times in the iron trade are not coming until the latter and not the former is the condition of trade.

But, though the above may be, in some degree, the reason why whatever reduction of production which has taken place has had so little effect, it is not by any means the chief reason. The simple fact is this: buyers do not believe it means anything. They know that the reduction and its continuance depend solely upon the determination and necessities of the manufacturer, and that in many cases neither of these would be proof against a respectable order at a very little advance. There is but one way in which a reduction of production can be made effective—it must be deliberate, general, and under such agreement, either by pledges or forfeit, as to make it binding. Suppose the nail manufacturers of the country were to agree to stop production from next Monday until Sept. 1, and were to be bound as we have indicated. Does anyone imagine that in our next issue nails would be quoted at \$2.40 in New York or \$2.50 in Pittsburgh? If the iron mills were to do the same, would iron sell for \$1.70 or less in Pittsburgh? We can answer the question, "Is the reduction of production of iron advisable?" by saying, so far as the manufacturer is concerned, yes! also, we think so far as the jobbers and consumers are concerned. The middlemen have been begging manufacturers for months to advance the

price of iron and hold it firm. They claim they would sell just as much and make as much or more money. To be sure, they would like notice of the advance a day or two beforehand that they might telegraph large orders at the low prices, but that is only human nature. Consumers also wish an advance. Every decline in iron causes a decline in manufactures of iron—such, for example, as wagons and agricultural implements—far more in percentage than the decline in the iron entering into their construction.

Is a reduction practicable? We have not conversed with a single manufacturer who has not freely conceded that the only salvation of the iron trade is in a reduction of production, but too many of them have prescribed the rude remedy for their neighbor, without manifesting any willingness to take it themselves. We believe, however, that there is a steady and rapidly growing sentiment in favor of reducing production by formal, united action. There is a strong belief that unless this is done the condition of trade will remain unsatisfactory, and that while with it some mills or factories may not make as much iron as they are making at present, what they do make will be at a profit. As mills are, or should be, run for profit and not tonnage and glory, sound business ideas will lead them to make fewer tons at better prices.

The New German Patent Law.

We print elsewhere in this issue the text of the new patent law of the German Empire to go into effect July 1st, prox. The bill was passed by the Reichstag on the 1st of May. We presume it will interest many of our readers to know the provisions of this act. Hitherto the protection of an invention by a patent in Germany has been attended with much trouble and expense. Not less than twenty-one States have issued patents independently, and without a patent in each State the protection was of little value. As Germany is now united under one imperial government, it has wisely nationalized its patent system. As will be seen from an examination of the full text, the new law provides substantially as follows:—Pharmaceutical compounds, medicines, alimentary preparations, and chemical products cannot be patented under the new law; processes, however, by which these articles are obtained can be patented. An invention must be novel, and not have been introduced to the public, so that another person can imitate the same. Imported inventions are not patentable; that is to say, patents for such will only be granted to their real inventors. It will be unlawful to manufacture a patent article, to import the same from another country, or even to use without permission a patented machine, tool, apparatus or process. Anyone having an invention in use at the time of application for a patent, cannot be prevented from continuing to use the same. A patent will last fifteen years; the taxes payable will be 50 marks (a mark is about 32 cents) for the first year, 50 marks for the second, 100 marks for the third, and so on with an addition of 50 marks each year. Thus a fifteen years' patent will cost 5300 marks. Patents of addition are to be granted at a cost of 50 marks. The taxes may be paid three months after date. Patent rights may be withdrawn by the government after three years, if the invention has not been carried into operation to a proper extent, or if the inventor has not taken the necessary steps to carry the patent into effect, or if he refuses licenses to others who offer a fair royalty, and it is advisable for the public good to grant such licenses. Anyone having obtained a patent for improvements on a patented article, and wanting a license from the first inventor, will be obliged to give the latter a license for his improvements. Foreigners must empower a German citizen to make their applications. The applications will be examined by the Patent Commissioners and experts appointed for this purpose. An appeal is provided for in case of refusal to the special Commissioner, and from him to the Imperial Court at Leipzig. In the case of poor inventors the payment of taxes may be postponed for two years, or altogether remitted. Specifications and drawings are to be open for inspection immediately after the application. After a patent is granted a short specification of the same will be published in the *Patent Journal*. Before the lapse of a patent notice will be given to the inventor, and a proper time allowed him to fulfill the requirements of the law. Infringement of patent rights is to be punished with a fine up to 10,000 marks, or imprisonment not exceeding one year. Marking articles as patented which are not so, will be punishable with a fine of 150 marks. At the publication of the invention, anyone thinking he has a prior right may enter an opposition, which is then examined in the presence of those concerned. Existing

German patents may be transferred to the empire, but cannot be prolonged.

It will be seen that the new law is modeled substantially after the American system, and its operations will greatly facilitate the security of patents by inventors in this and other countries.

The Decline in Lead.

Since our last editorial upon lead, in February, a speculative purchase was made in March by Western parties simultaneously in St. Louis and New York to the extent of about 2000 tons. The price advanced rapidly until it touched 6 1/2 c., currency, a figure which was at the time but about \$2 per ton below the cost of Spanish lead laid down here. The quantity thus got under control by operators soon proved wholly inadequate to the purpose, inasmuch as, on the one hand, production in the West was at the time unusually large; and, on the other, the spring demand for the metal at the seaboard soon proved itself limited. Our dealers and consumers, moreover, were decidedly opposed to such an advance in lead at this juncture, and made a stout front against the movement. They at once restricted their individual purchases to their immediate requirements, supplying themselves from outside sources somewhat below the figure demanded by the speculators. Within three weeks over 1500 tons were thus gradually bought by them in lots at New York, at or about 6 1/2 c., currency. This quantity having been largely distributed, a sufficient supply had been secured to allow both dealers and consumers to await further developments. According to the circular of Mr. Edward A. Caswell, of this city, dated May 15, the production of February, March and April in previous years has been appreciably less than the consumption of those months, and during that period all the surplus was used up and we began the summer with only light stocks, but this year not only has Missouri gone on steadily increasing, but the output of argentiferous bullion in the first four months of 1877 has exceeded that of 1876 by over 4000 tons. The consequence was that the incoming supply proved ample for the light spring demand; the stocks held on speculation were thus evidently a surplus, and therefore unsought for by the generality of buyers. While the stocks on hand on January 1, 1877, throughout the country were not over 3000 tons, they had on the 15th ultimo reached nearly 6000 tons. The market thus fell of its own weight, and a recovery could only be established either by an increasing demand for consumption, a fresh speculation or a decline sufficient to curtail production. A gradual decline, amounting to upward of 1 c., currency, from the highest previous point has thus been brought about without stimulating the demand, and without encouraging speculators to re-enter the market.

According to news now reaching us from the lead producing regions of the West, production has at length been somewhat curtailed, sufficiently so, it is to be hoped, to produce an effect on prices, and thus permit a resumption of operations in full, both at the mines and smelting works. Producers of the raw material have, at the same time, set to work seriously to reduce expenses, and be able henceforward to meet the market even in the event of no material improvement taking place in values. Lower freights also favor them, and by degrees we trust American lead may be produced cheap enough for a more extensive export to China and elsewhere. In the meantime the European market has been favored by the outbreak of war in the East, and the price without much difficulty advanced £1 per ton. A decline of 10/ took place since through a temporary oversupply from Spain, where an increase in the export duty is impending, to go into force next month. The cost of Spanish lead will then be indefinitely enhanced, and the war continuing, it is more than likely lead will rule as high in Europe as it has done previously during the spring.

The Fast Trains Again.

In our issue of June 7th we noted the fact that fast passenger trains had been put on to the lines between this city and Chicago, and that the time had been reduced to one night and one day (26 hours and some odd minutes, we believe). As we go to press it is reported that these trains are to be withdrawn very shortly, and the old 36 hour time taken for the trip. This is eminently sensible. The fast trains were attractive because they were fast, and because people like the novel sensation of moving at the rate of 60 miles per hour. But as they could gain nothing by it, and were set down in this city at night and had an extra lodging to pay for, the gain was a ruinous one, and the only advantage to the railroad companies seems to be gratuitous advertising. These re-

marks in regard to fast trains do not by any means apply to mail trains, although similar principles govern both. For example, there is no reason why a passenger train leaving New York at 10 or 11 p. m. should reach Albany or Troy before the next morning. In other words, this train will always be a slow one so long as the maximum speed of railway trains remains as it is at present. With the mail trains, however, the case is quite different; the bulk of the matter for the mail is not ready before 3:45 or 4 a. m. This mail should be in Albany and Troy as early as possible, and to do this it is quite worth while to put on a fast train which can make the distance in from 3 to 4 hours. The return mail from these cities to New York need not necessarily be a fast one, as it can start at the close of the day and take the whole night for the journey. In sending a mail West, it is possible, by using a fast train, to make a great many connections which, by a train somewhat slower, would have to be made upon the following day. The number of these connections, the advantages to be attained by them and the area of country or the population served, should determine the speed of a fast mail train over a given mile. Thus on some lines 35 miles per hour might be found to be ample, while on others the wear and tear of 60 miles per hour is amply paid for in the economy of distribution. And it may be found that while the train which makes the 26 hour run from Chicago to New York is of little utility for passengers, it is of the greatest use to the Post Office Department when its hours of arrival and departure have been properly adjusted. We may expect in the future that the fastest trains over long distances will be mail trains exclusively, and until there is a revolution in railroading, the passenger traffic will be carried on at comparatively slow speeds.

The Mollie Maguires.

The closing scene of the last act of the horrible tragedies that have disgraced the anthracite coal regions of Pennsylvania, is soon to be enacted. The application made to the Board of Pardons of Pennsylvania for the commutation of the death sentence of the eight Mollie Maguire murderers, was argued on Saturday last, and refused. This decision is final, and, unless something extraordinary interferes, by the time this reaches most of our readers they will have paid the penalty of their crimes. It seems a horrible necessity that such a tragedy should blot the records of our civilization, but it is not so horrible as the crime to be expiated. When we remember what these men have been guilty of, sympathy gives place to just indignation. The men not only coolly committed the crimes of murder for which they are condemned, but engaged to do them with alacrity. It certainly is no honor to the nineteenth century that such crimes can occur, and the only source of gratification is found in the belief that it is not a product of the times, but an attempt to bring the modes of past centuries into this.

We would be far from saying that trades unionism is responsible for these murderers. We believe that there are unions and many members of unions who would resist to the last any attempt to commit them to such acts, and yet it is a significant fact that almost every strike of any size is accompanied with murder or an attempt to commit this crime. This is so patent that it hardly needs examples to prove it. Within a few months only we have examples of this at Troy, Haverstraw, Cleveland and Streeter. The last was a most fiendish attempt to poison scores of men whose only fault was that they claimed the right to work for such wages as they could agree upon. Chas. Reade's romance of Sheffield tells of nothing more fiendish. Now, if these are the outcomes of trades unionism, even though they are not intended nor countenanced, it may be a serious question whether it is not the duty of the law to step in and at least regulate them. We do not mean that law has any right to say that a workman should not refuse to work at certain wages, but it has a right to say that no workman shall interfere with another who wishes to work at whatever price he chooses to accept.

From the latest reports from Capt. Eads it appears that in 60 days a ship drawing 23 feet of water can pass from New Orleans to the sea. The addition of another foot or two to the depth of the channel will only be a matter of time. The importance of this, not only to New Orleans, but to the entire West, is almost too great for calculation. For years the value of the Mississippi as a means for internal transportation has been limited by the fact that it had no outlet free to the ocean. Vessels built for the general Atlantic trade and of

sufficient size to ply economically between New Orleans and Europe, could not get up to the city. The river, which might easily have been the highway of the West to the sea was used mostly for local transportation. With the opening of the 22 foot channel it will be possible for New Orleans to regain her position among the important commercial cities of the world. The benefit to the Western steamboat interest will be enormous. This benefit comes at a peculiarly favorable time, it would seem. For the past few years the business has been very dull, and it is stated that comparatively few boats have been built, while a great many have been broken up. Iron boats are now coming into favor, and if the steamboat fleet is to be renewed or greatly enlarged, iron boats may be expected to be in the majority. The business will therefore revive under exceptionally favorable circumstances, which will go far toward keeping it on a substantial basis. In using iron as a material for the construction of boats and barges to be used on fresh water, we do not meet with the danger of corrosion found when it is used in salt water, and we have a material which seems to meet every requirement and to be almost without drawbacks. The prosperity of New Orleans and the river may be looked upon as assured in the immediate future.

There are indications that the labor troubles at Pittsburgh will not be over with the signing of the puddlers' scale, but that new demands will be made. It is leaking out that the muck rollers and bar rollers and heaters as well as the roughers and catchers are at work on a scale of prices which they propose to demand be signed by the manufacturers. At present there is no scale and no uniformity in the prices paid for muck rolling and bar mill work, the only scales in effect being the boilers and guide mill. The easy victory of the boilers will encourage the class of laborers above referred to to make their demand and to persist in it; and the probability is that it will have to be acceded to or a strike will result. Our information is to the effect that this demand will not probably be made at once, as so many of the mills are idle, but it will be made shortly.

THE NATIONAL ASSOCIATION OF STOVE MANUFACTURERS.

The Semi-Annual Meeting in Detroit, Michigan.

The meeting of the National Association of Stove Manufacturers, partially reported by telegraph in our last issue, was called to order by the president, Mr. S. S. Jewett, at 11 a. m., on Wednesday, June 13th, in the room of the Common Council of Detroit, Mich. In the roll call the following names responded:

Walter P. Warren, Fuller, Warren & Co., Troy, N. Y.
Geo. H. Phillips, Geo. H. Phillips & Co., Troy, N. Y.
James H. Coddington, Dighton Furnace Co., Boston, Mass.
Albert N. Parlin, Magee Furnace Co., Boston, Mass.
Charles Eddy, Eddy, Corse & Co., Troy, N. Y.
W. H. Whitehead, Tibbals, Shirk & Whitehead, Erie, Pa., and Chicago, Ill.
Geo. A. Tyler, Russell Wheeler & Son, Utica, N. Y.
H. S. Hubbell, A. S. Hubbell, Hubbell Bros., Buffalo, N. Y.
Sherman S. Jewett, Josiah Jewett, Chas. W. Day, Walter G. Seely, Samuel Bush, Jewett & Root, Buffalo, N. Y.
Geo. D. Sanford, National Stove Works, New York.
Joseph B. Wilkinson, Hicks & Wolfe, Troy, N. Y.
David Bell, Joseph Bell & Co., Wheeling, W. Va.
Aaron D. Patchin, Burdett, Smith & Co., Troy, N. Y.
C. H. Buck, Buck's Stove Co., St. Louis, Mo.
A. E. Chamberlain, Cincinnati, O.
Isaac A. Sheppard, Isaac A. Sheppard & Co., Philadelphia, Pa.
James Spear, James Spear & Co., Philadelphia, Pa.
Grange Sard, Jr., W. P. Kellogg, W. R. Harcourt, Rathbone, Sard & Co., Albany, N. Y.
Henry Cribben, Cribben & Sexton, Chicago, Ill.
H. Brayer, president, Co-operative Foundry Co., Rochester, N. Y.
G. F. Filley, Excelsior Mfg. Co., St. Louis, Mo.
Thad. J. Reed, James Reed & Sons, Warren, O.
A. G. Pattan, Columbus, O.
John J. Bagley, Frank H. Tefft, D. M. Thomas, Detroit Iron and Brass Mfg. Co., Detroit, Mich.
Francis Polens, M. I. Mills, J. Dwyer, Geo. H. Barbour, M. B. Mills, Michigan Stove Co., Detroit, Mich.
W. H. Tefft, president; E. S. Barbour, secretary; James Dwyer, superintendent; C. E. Ames, W. H. Irvine, T. J. Duffy, C. T. Boal, Detroit Stove Works, Detroit, Mich.

The address from the Chair was printed last week.

Mr. W. H. Tefft, of Detroit, presented the following address of welcome:

Mr. President and Gentlemen, Members of the National Stove Association.—It becomes my duty and pleasure to welcome you to the City of the Straits. Since the organization of the Society it has been the desire of Detroit members that you should hold one of the summer meetings here, and I trust the favorable opinions you may have formed of our city and citizens may not, on a closer inspection, be dis-

appointed. Although old in years, Detroit is comparatively young in manufactures, nearly all the factories now doing business here having been started within the past twenty years. I do not propose to show you the business of our city in detail, as it might not compare favorably with our more pretentious neighbors, but suffice it to say that by hard work, economy and close application to business some 120,000 people manage to make a living here. We propose to entertain the members with a boat ride upon our beautiful river and lake to-morrow afternoon. The steamer Excelsior will leave the foot of Woodward avenue at 1:30 p. m. Tickets will be furnished members during the day. Refreshments on board, so that it will not be necessary to dine at your hotel. For this afternoon it is proposed to furnish carriages, which will be at the Russell House at 3 o'clock, to take the members to the factories up the river, and then for a little ride about town. As we have no particular speech makers among the stove manufacturers of Detroit, I introduce ex-Governor Bagley, who will make some remarks. Although he does not know much about making stoves, he can tell you about making tobacco.

By request of Mr. Tefft, Ex-Gov. Bagley, of Michigan, addressed the meeting as follows:

Mr. President.—I don't know why I have been called upon to address this meeting unless it is because I am interested in the hollowware trade. I found it so cold this morning that I took down the almanac to see what time of the year it was, and when I found opposite the date of June 13, "About this time look out for a meeting of the National Stove Association," I knew why it was so cold. While the people of Detroit will doubtless shudder as they hear that so many stove men are among them, they are also reminded that the time is coming when they will have to buy new stoves. I look upon this Association as a good thing. It brings business men together from all parts of the country. Business men who are in competition with one another meet socially and cultivate friendly feelings. We should realize that we cannot take our stoves or our money with us when we die, lest perhaps they should burn up; so while we do live we should take occasion to mingle together as often as possible. There are none of us that have done business for any length of time without feeling the unwise and indiscreet competition that has entered into all classes of trade. As a result of that disastrous competition everything has gone down hill, and we now realize that we will be compelled to pay for the ten years of extravagance and high living that have cursed the country. I have faith, however, that with good management at Washington, and with peace throughout the length and breadth of the land, we can see the silver lining of the cloud. I rejoice that the country has come to consider that there is something in the country beside politics. Again, Mr. President, I welcome you to Detroit. I am certain that the people of Detroit will treat you as they treat every stranger—take you in. The gentlemen who are in the stove trade here will take you around. They will show you our beautiful homes, and I may here remark parenthetically that we have no tenement houses here; that every man owns the roof that shelters him or his boat, and it is the anchor that holds our people to Detroit. And Detroit is only a sample of what Michigan is. Our State is made up of New York and New England people, and they are good folks. We have brought up our children to fear God, hate the devil and look out for snakes. And now, in conclusion, I bid you three welcome to Detroit, and hope that all the meetings of the Stove Association will be held here in future.

Ex-Gov. Bagley was then invited to sit as a member during the meetings.

Mr. Chamberlain suggested that, before proceeding further, it would be proper to take some action on the able and valuable address of the president.

Mr. Sard moved that it be spread upon the minutes and referred to a committee for consideration. The chair appointed Messrs. Sard, Filley, Eddy, Chamberlain and Whitehead such committee.

Mr. Sard said: There is living in this city a gentleman formerly in the stove business, but who had enough good sense to get out of it, and to take a fortune with him. I think the presence of such a gentleman here would be pleasant to us as a reminder of old times, when we used to make some money. We fear there are too many in the stove business, and that the room which some of us occupy is needed. I move that Mr. E. C. Beach, of Detroit, be invited to a seat in this Association. The motion was adopted.

Mr. Whitehead called attention to the fact that at a previous meeting a committee had been appointed to consider the subject of credits. As this subject had not been much discussed, he thought it might properly claim the attention of the Association.

Mr. Jewett said that the committee had been called to meet for conference the previous evening, but owing to the absence of most of the members, nothing has been done. He thought that as Mr. Eddy had given the matter considerable attention, he could probably give the Association some information of value.

Mr. Eddy said: I presume every member of this committee has made some inquiry into this subject, as to the desirability of forming a credit bureau, but circumstances have prevented any joint action on our part. It has been ascertained that a Bureau of Credit for the hardware and stove trades has been established in the West, having its office in Chicago, and that a system has been adopted which, if accepted by the trade, promises to be of benefit. The Bureau now embraces only the Southern and Western states. I do not see how they can make their system effective without taking in the Middle and Eastern states. The manager of the Bureau, Mr. De Bernard, is present, and when the Association is ready to hear him he will probably be glad to explain the system.

At the invitation of the chair, Mr. De Bernard said: The system adopted by the hardware dealers is based upon the idea that the trade, as a whole, possess more knowledge of the standing of dealers than can be had from outside sources, and aims to give to those who want it the information possessed by others in the trade. In other words, the information which anyone in the trade has is made available for the use of all. Without going into minor details, he would say regular semi-annual reports are required of each member concerning their customers, and the information thus collected is made available for the use of all others.

Mr. Whitehead, in response to a request for his views, said he had given the system some attention, and had found it quite satisfactory. He described the workings of a credit information system which had been employed for some time by the wholesale furniture dealers of Chicago and elsewhere, and expressed the belief that it would apply in the stove trade with equal advantage.

Mr. Filley said that Mr. Bell, who had charge of the credit department of the house he represented, had given the subject attention, and had reported that the information furnished by this Bureau was more valuable than that from all other sources combined.

Mr. Eddy thought that a bureau giving especial attention to the hardware and stove trades would be able to collect much fuller and more exact information than was furnished by the agencies which propose to give information concerning everybody and everything. He moved that the matter be referred to the existing committee to consider and report upon it.

Mr. Ransom, of Albany, not being present, Mr. Chamberlain, of Cincinnati, was added to the committee.

Mr. Warren moved that committees be appointed to prepare suitable resolutions on the death of Messrs. P. Rollhaus and B. M. Anthony. He appointed Messrs. Spear, Cribbia and Buck a committee on Mr. Rollhaus, and Messrs. Barlow, H. Hubbell and Myers a committee on Mr. Anthony.

Mr. Chamberlain moved that the invitations extended by Mr. Tefft to the entertainments provided by the stove manufacturers of Detroit be accepted with thanks. The motion was adopted.

Mr. Tefft said that at the last meeting the following resolution had been introduced: "That in the present depressed condition of business, we must recognize the fact that the demand for stoves has fallen off, and that a less amount of business must be done than formerly; hence, we recommend that each firm accept the situation and reduce their production to a less amount than in former years." He thought that this should be especially considered and reported upon by the business committee.

The Chair said that as this question had been touched upon in his address he had no doubt it would be duly considered by the committee to whom the address had been referred. After some general talk the Association adjourned to meet the following morning at 10 o'clock.

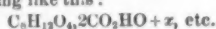
SEEING THE CITY.

After dinner the members and guests of the Association were provided with seats in open carriages and taken for a pleasant ride about the city. The weather was clear and warm, and all the conditions favorable to enjoyment. The first establishment visited was the foundry and warehouses of

THE MICHIGAN STOVE COMPANY, on Jefferson avenue. The building is a large brick structure, attractive in appearance, commodious and convenient. It has a frontage of 50 feet with iron columns and plate glass windows, a depth of 450 feet and is 6 stories high. It was built in 1871. The sample room, foundry and finishing shops were the only parts of the establishment visited. The former is a fine room, well lighted and with high ceilings, filled with samples of the large line of goods manufactured by the company. After a hasty examination of the display, which was not without some surprises for the Eastern visitors, the company passed through into the foundry. This is a well ventilated building, 236x90 feet, with an L 50x62 feet and 100x120 feet. The works are running quite full, and are making up a large stock of fine stoves for the season's trade. The cupola is of 30 ton capacity, and is so situated as to be convenient to the various floors. From the foundry the company were conducted to the various shops where grinding, fitting and finishing operations are carried on. The stock house, which adjoins the foundry, is of 120x100 feet area, with a spacious wharf accommodation on the river. The capacity of the works is 25,000 stoves per annum. A force of 325 men is employed, and the number will be increased as the season advances. The investment is about \$450,000. The officers of the company are F. Pains, president; M. I. Mills, vice-president; G. H. Barbour secretary, and J. Dwyer, manager.

A CHEMICAL WORKS.

From the Michigan Stove Co. the party were driven to a chemical works not far distant. There was not time to examine the processes of manufacture, but the product was sampled in glasses with handles. We did not learn the name of the fluid, but we believe its formula is something like this:



Using the new nomenclature, this would read:



The next point of interest visited was the establishment of

THE DETROIT STOVE WORKS, on Jefferson avenue. This company was organized in 1864, and occupied small wooden buildings on Elliott avenue. Compelled by the demands of a growing trade to provide themselves with more commodious quarters, the company purchased five acres on Jefferson avenue and the river, and erected the fine buildings now occupied by them. The sample room contains an extensive line of stoves of all kinds, which attracted much attention and were greatly admired. The officers of the company are W. H. Tefft, president; H. J. Fisk, secretary, and Jeremiah Dwyer, superintendent. The paid up capital stock is \$300,000, and the capacity of the works 30,000 stoves per year. The force employed consists of about 350 men, the monthly payroll is about \$16,000, and the yearly sales about \$500,000.

From here the company were conveyed to the

PULLMAN CAR SHOPS, to see a new car, which was certainly an object of great interest. The body, which is 63 feet in length by 10 feet in width and about 9½ feet from floor to top of roof, is painted in the standard color of the Pullman Company, the woodwork being highly polished and decorated sparingly after the richly simple style known as the Queen Anne. The windows are arranged in three—a broad and high sheet of plate glass extending nearly to the roof, and a narrow and shorter one on each side of this. The running gear and attachments require notice. The trucks each have six "paper" wheels of 43 inches diameter. Of these paper wheels, with their steel tires strongly bolted and turned to a perfect circle, it is claimed, after an experience of several years, that the paper discs, closely compressed by hydraulic pressure, which form the core, are practically indestructible, and, moreover, that they impart a certain elasticity to the tread of the wheel, in lieu of the constant jarring and disintegration of solid iron ones; while the steel tires certainly show a wonderful mileage—as high as 50,000 or 600,000 miles, if we allow for their being turned true three times in the course of that service. The bearings of the wheels are of an improved style, original with the Pullman Company, the principal feature of which is a brass plate fastened to a stop wedge, against which plate the end of the journal plays. This plate can easily be renewed, and prevents the wearing away of the shoulder of the journal and of the bearing upon which it rests in the ordinary box. Hot boxes with these bearings are practically unknown. Among the other external fittings we note the Westinghouse brake, the Miller platform and the Congdon brake shoe. Entering the car from the rear, we pass through a compartment door to the right, into the kitchen, a compactly arranged little apartment, containing on one side a Wilk's range, and opposite, a sink with hot and cold water pipes, shelf, ice box, drawers lined with galvanized iron, for meats, etc., and all the needed conveniences for cooking. A slide communicates with the butler's room, next in front, containing a broad shelf upon which the cook deposits the viands. Emerging from the kitchen and going through the passage way, with the butler's room, china and linen closets on your right, and a pair of snug receptacles for the tables and certain table supplies on our left, we push a door which opens noiselessly from either way, and closes automatically, and find ourselves in the main saloon, containing seats, and at night, berths. The finish of this apartment, which is entirely in light woods, is beautiful. The prevailing woods are white oak for the plain work, and for panels polished burl ash, white holly, satin wood, and here and there bits of rosewood and mahogany, bringing out the most delicate effects of marquetry. The Queen Anne style is reproduced in its purity, and a simple and yet rich effect is produced by setting the moldings in instead of fastening them upon the body of the work, raised panels of fancy woods, however, giving a pleasant contrast. The ceiling, instead of the usual frescoing, is also of wood paneling and moldings. Passing from the main saloon, we enter a private drawing room, adjoining which is an elegant bed and dressing room. Opposite this is a little apartment in which the Baker heater safely and effectively prepares the hot water that circulates in pipes under each seat. Beyond and at the end is, on one hand, the gentlemen's lavatory, with two marble topped wash stands and all other needed appliances, and on the other the gentlemen's toilet room, a good feature of which consists in a number of panels of fragrant cedar. Another feature necessary to notice is the perfect ventilation. So admirable has this been accomplished that none of the unpleasant odors of the kitchen can enter the main saloon or private drawing room, and would not even if the kitchen end were in front. The visitors were courteously received by Mr. Biscell, superintendent, who permitted them to inspect the car and furnished all necessary information.

From the Pullman shops the company proceeded to the

DETROIT NOVELTY WORKS,

occupying the buildings on Mt. Elliott avenue, formerly used by the Detroit Stove Company. The stay here was brief, and only gave the visitors time to see in operation the superior machinery for grinding the hollowware which is produced in this establishment of more than average excellence of finish.

On the way home another chemical works was visited, and the product subjected to qualitative and quantitative analysis. The ride extended over about four hours and was greatly enjoyed by all.

An account of Thursday's proceedings and recreations will be given in our next issue.

Scientific and Technical Notes.

The recent disastrous accidents resulting from the use of electric exploders at the Sutro tunnel works, have led Mr. Sutro to make

SOME INTERESTING EXPERIMENTS WITH EXPLODERS,

which are described as follows by the Virginia City Enterprise of recent date: Electric exploders made by different persons were placed in a strong wooden box, which again was placed in another box in Mr. Sutro's parlor. This room is covered with a heavy Brussels carpet, walking over which causes the human body to be speedily charged with electricity. Mr. Hancock, the chief blaster, assisted in the experiments, and held the wires, while Mr. Sutro walked round the room two or three times with slippers, sliding his feet gently over the carpet. After doing this he approached the end of one of the wires with his forefinger, and instantly a loud report was heard, the ex-

ploder having been discharged. This first experiment was with one of the San Francisco Giant Powder Company's exploders. Then one of the Electrical Construction Company's was tried, without effecting its discharge. Next, one of George M. Mowbray's, of North Adams, Mass., was used, which did not go off on the first trial, but did on the second with a very loud report. After this another of the giant exploders was tried, which went off by the time Mr. Sutro's forefinger had reached within two or three inches from the end of the wire. These experiments have clearly established the fact that exploders may be set off by electricity accumulated in the human body, and the men about the tunnel were at once informed of the fact. Instructions were also issued for handling them hereafter, and a sheet iron plate was placed in the floor of the exploder house, to which is connected a wire reaching into the water flowing from the tunnel. The men in handling exploders now stand on this iron plate, and have instructions to wet their boots before entering, and to put on India-rubber gloves before touching the exploders. If these precautions are properly carried out there will be no danger of explosions hereafter. Any electricity accumulated in the human body will at once be carried off through the iron plate, while the rubber gloves, being non-conductors, form an additional protection. No accidents from these explosions have ever occurred inside the tunnel, for since the plate is very wet no electricity can be retained in the body.

Mr. G. G. Caldwell, of Baltimore, has invented a means of

PROPELLING SHIPS BY STEAM PUMPS,

and built a vessel to illustrate the workings of his system. The Baltimore Gazette describes the craft as follows: The Alpha is a Baltimore built boat, constructed on the tugboat model, and as neat a thing of the kind as there is afloat. She is 43 feet in length, and has 10½ feet of beam. She is furnished with one 16 horse power horizontal tubular boiler, and a No. 7 Knowles pump. From the pump to the stern are two lines of pipe, which strike the water about three feet beneath the surface. Two similar lines run to the bow. The pump drives through each pipe a 2½ inch stream, which enters the water through a ¾ inch nozzle. With 60 pounds of steam the pump makes 180 strokes to the minute, each stroke driving a stream into the body of water. This is all there is about this wonderful device. And yet, under all the disadvantage of a trial trip, this was the device which yesterday enabled the Alpha to make 10 knots an hour under 60 pounds pressure. There was not a ripple astern, and no perceptible displacement of the water, except the little made by the cutting of the bow. She was backed and turned with perfect ease. To back the boat the stream is driven through the bow nozzles, and the craft obeys on the instant. If the boat were to spring a leak, the pump would simply draw its supply from the hold and go on with its work. It is claimed that a vessel provided with this appliance could not sink under ordinary leakage. For prudential reasons there was no experiment in this line yesterday. A remarkable feature of the Caldwell contrivance is that the power which propels will also steer. To accomplish this the nozzles are worked alternately from side to side, using the streams as levers, on the principle of the oar. There is yet another use to which this device can be applied. In case of fire on board or about the docks, a line of hose is attached to the pump, and in a second there is a floating steam engine, which at least holds its own with anything on wheels. The inventor claims that his device can be profitably applied to any vessel, although it is mainly intended for canal service, where the demand is for a cheap propeller that will not wash the banks. Mr. Caldwell declares that both the first and after cost of his invention will be far less than that of anything now in use. The entire driving apparatus is below, and no part of it could be carried away by accident or design. The whole thing is so simple that there is not much to get out of order, and nothing that could not easily be repaired. The attempt of the British government in 1865 to apply water as a propelling power to vessels is the only similar effort within our knowledge. The Water Witch was propelled by streams forced out at the sides, a rotary fan supplying the power. The Water Witch achieved a failure, and retired from business. Mr. Caldwell's invention has been patented in Europe as well as in this country. The method employed abroad for

CASTING THE STEMS OF SHIPS IN BRONZE

employs dry sand and loam in much the usual way and a wooden pattern. The metal is composed of copper and tin, and a stem forty-five feet long will weigh on an average about ten tons. Describing this remarkable operation of casting in the case of a number four stem, the charge consisting chiefly of old brass or bronze guns, an English journal states, in respect to the time required, that at half-past four in the morning the charging began, and in four and a half hours, there being a remnant from a former casting in the furnace, some seven and a half tons were melted down. Gradually adding some five tons of metal up to one o'clock, ten and a half cwt. of tin were admitted, and by two o'clock all was ready. Just immediately before tapping, a number of slabs of zinc or spelter, weighing in the neighborhood of one hundred and fifty pounds, were cautiously slipped into the molten mass and the whole well rabbled. It was so arranged that the finished metal in the furnace should have something like the following composition: Sixteen ounces copper, one and three-fourths ounces tin, and one-half ounce zinc, the resulting alloy being guaranteed to stand a tensile strain of fifteen tons per square inch. In all, about four tons' weight of old guns were used in the production of the charge of fully fifteen tons. The running was completely successful; among the various notable features of the process being the reception of some eight tons of the metal into a kind of reservoir from which it passed through a shutter, raised at will by a lever, and on through no less than thirty runner gates.

INDUSTRIAL ITEMS.

MAINE.

It appears that the American rifles, firing thirty-six cartridges each, which the Russians were recently astonished to find in the hands of some Turkish soldiers which they captured, were made by the Evans Rifle Manufacturing Company, of Mechanic Falls.

NEW HAMPSHIRE.

The Ranlet Manufacturing Company, Laconia, are driving their car-building machinery to its full capacity. Their contract for 200 freight cars for the National Dispatch Line is half completed, ten finished cars being sent off each week. These cars are built exceedingly strong. All the rolling stock for the Medford and Billerica narrow gauge road is in process of building by the Ranlet Company. This new road is a twenty-four inch gauge.

MASSACHUSETTS.

The Boston Rolling Mills, at Cambridgeport, are full of work.

The car shops of Osgood Bradley, at Worcester, have been closed for the present for want of work.

The Springfield Foundry Company, now at Chicopee Falls, are to remove their business to Springfield, and a new foundry for their use at the foot of Broad street will be ready July 1. Builders' hardware is their present specialty, and the firm will employ 45 men.

The Lamb Knitting Machine Company, at Chicopee Falls, are rapidly preparing to put the Tuttle machine on the market, the right to manufacture which they have lately acquired. The new machine can rib its work, which is a great advantage.

The Deerfield and Sunderland selectmen advertise for proposals for an iron bridge over the Connecticut River, to be formed of five spans, each 165 feet long, with a roadway 18 feet wide, and also for proposals for a Howe truss wooden bridge. The bids will be opened on the 27th.

The Valley Machine Company, Holyoke, expect to begin work in their new foundry Monday morning, and the first blast will be taken about the middle of the week. In addition to making their own castings they will do some outside work.

The Warren File Company will probably occupy a part of the new addition to Mosher, Wait & Co.'s Mill, at Holyoke.

The Boston and Albany car shops, at Worcester, are fitting up some of the Baltimore patent racks for their passenger cars. These trucks have wheels forty inches in diameter, which is eight inches larger than common car wheels. The wheel is loose on the axle, as is also the axle in the box, and it is claimed that it requires less motive power to draw a train with these trucks, and also that danger is averted in going around curves by having the wheels loose on the axle. If the experiment proves successful, the wheels will be used on all passenger trains on this road.

The Richmond Iron Company's Furnace, at West Stockbridge, is in blast.

The Russell Cutlery Works broke their water wheel last week, and are putting in a new one. It will take two or three weeks to get ready for the full force of workmen.

The Mason Works, at Taunton, have just shipped a narrow gauge engine to the North Pacific Coast Railroad, Cal.

CONNECTICUT.

The first train of brown hematite ore ever shipped from the Tobey Hill ore mine has been sent to Landon & Co.'s Furnace in Chapinville. The quality of this ore is nearly the same as that of Salisbury ores, the quantity of pure iron being larger than in the ore from these mines. The construction of a furnace near Tobey Hill is contemplated. The mine is so arranged that 15 laborers can be advantageously employed, and can raise about 100 tons of ore a day, should it be necessary to do so. Something like 3000 tons are now dug and ready for transportation.

An establishment at Wilkinson, in the town of Burlington, produces steel shears, screw drivers, and a variety of other useful tools.

The contract for furnishing bronze hardware for the new capitol building, Hartford, was awarded to Messrs. P. & F. Corbin, of New Britain and New York. The Hartford *Courant*, commenting on this transaction, says: "Those of our readers who noticed the fine display which they made at the Centennial last year, will remember that there was nothing to equal their exhibit, both in variety and elegance of workmanship, in the whole Exhibition. The capitol commissioners can rely upon having their contract carried out in good faith, and an elegant class of work will be furnished for the new building."

The smelting works of the Hartford Nickel Company were burned Monday night; estimated loss, \$15,000; no insurance.

The Woodruff Iron Works, at Hartford, which have been employing 70 men on small work, are going to shut down.

The Pratt-Whitney Company and Beach & Sons' Iron Works, at Hartford, have just finished one of the Lay torped boats, and a public exhibition will be made in the river some day this week. The boat is about twenty-five feet in length. It is built in the so-called cigar shape. It is propelled by the use of condensed gas, the movements being controlled by parties on shore. The engine and screw are of small proportions, but are very powerful. The explosive material is contained in the forward end and is fired by means of electricity.

NEW YORK.

In a recent issue we stated on the authority of Mr. A. D. Lusk, of Philadelphia, agent of Messrs. Bowen & Signor, Saranac, N. Y., that this firm was the only one making iron by the Peckham direct process, described by Prof. Osborne in recent issues of *The Iron Age*. We are now informed by Mr. Peckham that the process is also worked by Messrs. Nichols, Hull & Co., of Cadyville, N. Y., who are using

AMERICAN SCREW CO.,

Providence, R. I.

Manufacturers of

IMPROVED
Gimlet Pointed Wood Screws,
Patented

May 30,

1876.

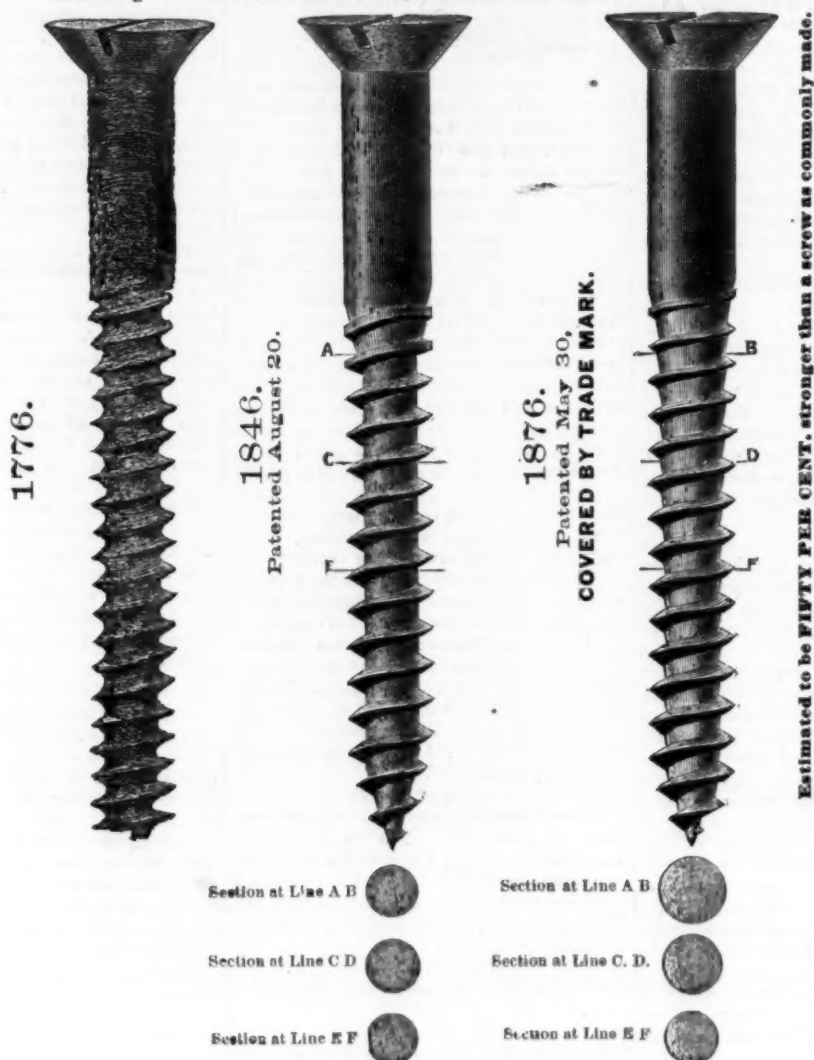


After forty years' experience we offer to the trade our Centennial Screw, patented May 30, 1876, as the best we have ever known.

The method of manufacturing is also patented, and we are changing our machinery as fast as possible, to manufacture the improved article only. To introduce them, they will be sold at same price as the old style screw.

The new screws will be packed in manila colored boxes with new label covering end of box, and enlarged figures showing plainly contents.

To distinguish this screw we have adopted a trade mark, which is also secured to us.



The above drawings show the progress of screw making from the old blunt point to style now adopted.

Experience has shown that the weak point of screws, as formerly made, is at the heel of the thread, where all the strains of forcing the screw into the wood naturally concentrate.

To avoid the sharp angle existing in the old style of screws has been the aim of all manufacturers, but every expedient hitherto adopted has proved as objectionable as the evil complained of.

It will be seen in our new screw that not only is the sharp angle avoided, but the strength very much increased, as illustrated above. See sections at lines.

CLAIM.

"A Pointed Wood Screw having the outer periphery of the thread upon its body cylindrical, while a portion of the body below the thread and near the neck is conical, the remainder of the body to the point being cylindrical, and yet having all the thread brought to an edge of a constant angle, without jogs in the paths between the threads, substantially as described."

the product in the manufacture of horse nails. Messrs. Bowen & Signor make about 175 tons per month; Messrs. Nichols & Hull about 120 tons.

The receiver of the Olcott Iron Company will advertise the works and other property for sale within the next 60 days. The old stockholders will have the opportunity to subscribe to stock of a proposed new company. For the new company a capital of \$150,000 is required, of which \$130,000 has been subscribed. If the balance is not forthcoming within the time prescribed, then the property will be sold, subject to mortgages, and the receiver will make assessments on such of the stockholders as he may select for an amount equal to the floating debt, which is \$225,000. There are of the second mortgage bonds unsold \$110,000. Interest against the company is accruing at the rate of \$100 per day, and all the stockholders, but more particularly those living away from Albany, are growing restive under their burden. Up to the present time there has been sunk in this enterprise about \$725,000.

PENNSYLVANIA.

The Wheeler Furnace, at Middlesex, will blow in soon.

It is stated that one of Pierce's furnaces, at Sharpsville, will go in blast in a short time.

The Wampum Furnace is in full blast. During the month of April, Messrs. E. & G. Brooke, of Birdsboro, manufactured 14,173 kegs of "Anchor" brand of nails, and shipped 17,047 kegs, being the largest number of nails ever shipped from their works in one month.

The Pine Iron Works have been running on full time for the past six months, which is unprecedented in the history of this establishment.

Mellert & Co., Reading, began work on their New Jersey pipe contract on Monday; 165 hands will be employed, and the contract is to be completed in three months.

John Roach & Son, of Chester, have closed a contract with a firm on the Pacific coast for the construction of three new steamships of about 1100 tons each. These vessels will be used for trading between Alaska and San Francisco.

Boyle & Hazlett are erecting 12 new coke ovens at their works in Bridgeport.

At the Reading Galvanizing Works nearly 100 boilers for kitchen ranges and a large number of bath tubs are galvanized each week for shipment to Baltimore. Large numbers of water and soil pipes are also being galvanized at the same place.

The Huntingdon News believes the work on the buildings for the plate glass works will commence in that place by the 15th. The machinery will be constructed in Belgium.

The Cornwall Furnace is receiving charcoal from the Blue Mountain.

The National Iron Works, at Danville, are to be started next month.

At the Norris Iron Works, Norristown, a casting weighing 13 tons was successfully made. It is a bed for a squeezer, and was made for the Phoenix Iron Company.

The largest stock of iron ore that was ever stocked upon Spang & Kaufman's wharf is to be seen there at present. The ore is shipped to the Keystone Furnace Co., at Reading.

Shenango Furnace No. 1, at West Middlesex, blew in on Sunday, the 3d inst.

The Pennsylvania Rail Mill, Danville, is busily at work.

The Danville Iron Works are in constant operation.

The mill at Fern Dale is undergoing repairs, and many of the men are at the Catawauqua Mill, which is running very full this week.

Rumor has it that the Allentown Rolling Mill will start up with full force on Monday next. When running full handed 1000 men are required.

The Lehigh Car Wheel Works have turned out a number of wheels intended for the Great Eastern Railway, of England, and have considerable orders from South America.

PHILADELPHIA.

The Delaware Bridge Company have contracted with the Pennsylvania Railroad Company for a bridge at Rockville Station to cross the Susquehanna River just above Harrisburg. A. & P. Roberts & Co., Pencoyd Iron Works, make nearly or quite all of the iron. The Edge Moor Iron Company do the fitting and prepare the iron for erection. The aggregate weight of iron will be about 7,000,000 pounds. The bridge will be completed before December next.

Steward & Stephens, have secured the contract for supplying iron to be used in the construction of the new Post Office. About 1,700,000 pounds is the quantity named, chiefly in beams, girders, &c.

Quite a number of vessels are now undergoing repairs and new ones being built at the various shipyards of Philadelphia. Baird & Huston have contracted to build a steamer for the Light House Board, an excursion steamer 85 feet long, and a large iron tug, 85 feet long, for New York, and are just finishing a wooden tugboat for service in the Delaware River. Another firm on Petty's Island is rebuilding two small steamers—the Phelps and Fairchild—and, also, repairing the steamboat Vesper. At Cramp's yard, the Reading Company's colliers, Nos. 11 and 13, are undergoing repairs, and the American Line steamship Illinois is receiving repairs to her shaft, which will be finished by next Tuesday. The Russian frigate Crayser, which also lies at this yard, is rapidly approaching completion in her extensive repairs. The same firm took a contract for putting a pair of new boilers in the steamer Empire State. The work was to be completed in ninety days, and in spite of the extent of the work it was completed in the time agreed on. The Messrs. Cramp are also engaged in putting on extensive repairs on the steamer Lavaca. A new upper deck will be put on her and machinery repaired, and after being fixed up the vessel

[Continued on page 18.]



Made of Thos. Firth & Sons' Best English Cast Steel.

C. E. JENNINGS & CO.,
Office and Depot for
J. L'Hommedieu Ship Auger Works,
MANUFACTURERS OF
AUGERS AND AUGER BITS for SHIP BUILDING, BRIDGE BUILDING and RAILROAD USE.
ALSO FOR

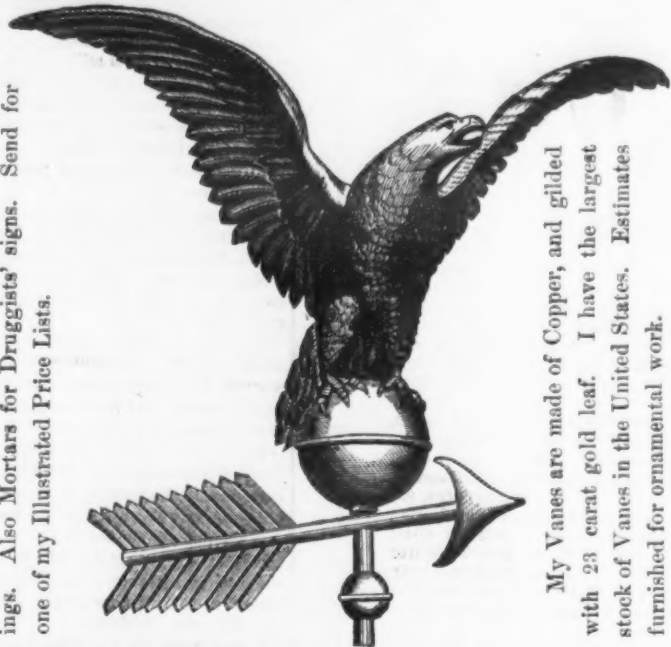
THE BROOKS EDGE TOOL COMPANY,
Manufacturers of Axes, Hatches, Adzes and other Edge Tools.

No. 98 Chambers Street, New York.



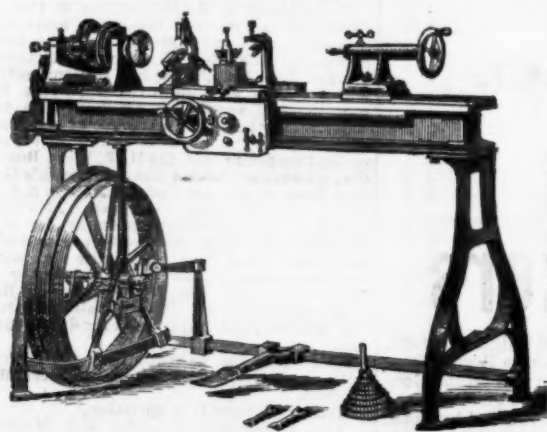
All Patterns and Weights in stock at our New York Warehouse.

Weather Vanes of every description, made from drawings. Also Mortars for Druggists' signs. Send for one of my Illustrated Price Lists.



My Vanes are made of Copper and gilded with 23 carat gold leaf. I have the largest stock of Vanes in the United States. Estimates furnished for ornamental work.

V. W. BALDWIN, 213 Pearl Street, N. Y.
Manufacturer of
COPPER WEATHER VANES,
Emblematic Signs, Etc.



Israel H. Johnson, Jr.,
& Co.,
Tool & Machine Works
Manufacturers of
LATHES
And Their Attachments,
of every variety, for Machinists,
Brass Finishers, Wood Turners,
Jewelers and Amateurs, to run by
foot or steam power.
Crank Shapers, Buffing Machines,
Screw Machines, Turret Heads,
Drop, Screw, Lever and Mandrel
Presses, Screw and Eccentric
Punches, Screw Clamps, Lathe Car-
riers, Reamers, Taps, Dies, &c., also
Rotary Circulating Fans, Shafting
Couplings, Hangers, Pulleys, &c.
Designing and Building of New
and Special Tools and Machinery.
Illustrated Catalogue and Price
List free on application.
No. 440 North Twelfth St.,
above Noble,
Philadelphia, Pa.

BRIGHAM, LITCHFIELD & VINING,
Manufacturers of all kinds of
TACKS, BRADS, NAILS, &c.

All headed work assorted by our new **PATENT ASSORTER**, which removes all dust and slivers and imperfect Tacks, so that the purchaser pays for nothing but perfect goods. Every kind of Tack or Nail made to order from samples. We allow nothing but first-class work to go out of our factory.
Also Manufacturers and Proprietors of

HENDRY'S PATENT CARRIAGE AXLE.

Patented June 29, 1875.

Patented June 18, 1876.

DESCRIPTION.

A, Section of hub complete, showing oil-chamber o. B, Front band. C, Nut which screws on to box D, and confines box D and band B to the hub. D, Box and back band in one piece. E, Axle. F, Wrench to place on back nut. G, Axle with back nut unscrewed from box, and both slipped from the collar, showing leather washer each side of collar, and front band in place.

POINTS OF EXCELLENCE.

No oil can come in contact with the wood of the hub. No oil can escape. No dirt, gravel or water can work. It holds the wheel in a superior manner. It is easier to oil than a common axle. It is adapted to any kind of a wheel. It requires no wadding to box the wheel. It will run 50 to 100 miles at a single oiling.

In ordering, give size of axle wanted, diameter of front band, and diameter of hub.
SOUTH ABINGTON, MASS.
WAREHOUSES,
97 Chambers and 51 Reade Sts., New York.

BAEDER, ADAMSON & CO.,
Manufacturers of **SAND & EMERY PAPER & EMERY CLOTH.**
(Also, in Rolls for machine work.)

Ground Emery, Corundum & Flint, Glue & Curled Hair, Hair Felt, & Felt-
ing for Covering Boilers, Pipes, &c., Cow Hide Whips
Stores: PHILADELPHIA, 730 Market St.; BOSTON, 143 Milk St.;
NEW YORK, 67 Beekman St.; CHICAGO, 182 Lake St.

TO MANUFACTURERS & DEALERS IN SKATES.
CAUTION.

A re-issue of letters patent Aug. 19, 1874, No. 154,176, re-issued May 4, 1875, No. 6,410, re-issued Feb. 20, 1877, No. 7,524, application filed Nov. 14, 1876, having been granted to Oliver Edwards, all manufacturers and dealers are notified that they must cease making or selling any skates infringing the same. Special attention is invited to claim 8, "a skate runner having its bottom constructed with a laterally projecting rib and its standards provided with plate supporting brackets, all made in a single piece of metal, substantially as and for the purpose described."

Nearly every cheap, all-metal skate in the market infringes this claim. Manufactured only by the

FLORENCE MACHINE CO., Florence, Mass.



With this machine two men can do the work of six or eight by hand. Since it has become known at the Centennial Exposition it is being sent throughout the world. One party has already given an order for 25 machines.

For machines or agencies address
W. WEAVER,
Phoenixville, Pa.

THE FLORENCE OIL STOVE.

For Heating or Cooking.

TWO STOVES IN ONE.

Safe, Odorless and Durable.

Can be used without chimney-flues, as it generates no smoke or noxious gases.

Meats and Bread cooked by this stove are better flavored and more digestible than when cooked by coal or wood.

THE HEATER furnishes an abundant supply of pure, moist heat, easily regulated to any desired temperature.

The Cook, with Baker.

The **FLORENCE** received the only Centennial Medal awarded to Oil Stoves. Report of the Judges: "It is simple in construction, easily managed, and well adapted to its intended purpose."

MADE BY THE **FLORENCE SEWING MACHINE CO.**

FLORENCE, MASS., Manufacturers of THE BEST SEWING MACHINES.

General Agencies—39 Union Square, New York; 476 Washington St., Boston; 66 Lake St., Chicago

Agents wanted everywhere.

CROSSLEY'S
Patent Slave Joiner.



The most Simple, Durable and Perfect Joiner made. In four sizes, jointing from 16 to 46 inches in length. In use from Maine to California. Is used by the largest stave and barrel manufacturers in the world. Will pay for itself in 90 days in saving of time and timber over any Saw Joiner ever used. Send for circular to.

H. A. CROSSLEY,

78 Columbus St., Cleveland O.

FIRE HYDRANTS

AND

Eddy Valves.

All Styles and Sizes.

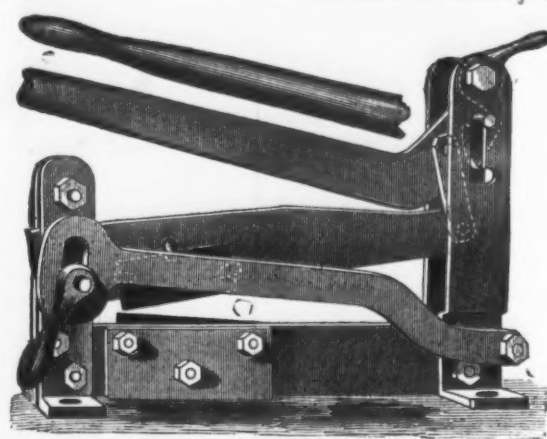
Made (and patents owned) by

THE

MOHAWK & HUDSON

MFG CO.,

WATERFORD, N. Y.



PATENT
WROUGHT IRON SHEAR.

When not in use occupies a space 6x30 inches, and in use the same space with sufficient room to bring down the lever. Weight 180 pounds. Knives have 10 holes in them, and can be taken out in three minutes. Can be renewed at the mere cost of the steel. One set of knives should last several years. Guaranteed to cut, readily, Iron Bars 4x3, 6x3, 1x round, 1x square; will also cut Plow Steel.

We offer them at \$12.00 each, with a liberal discount to the trade.

BROWN & CURTISS,
MANUFACTURERS OF
Patented Wrought Iron Wagon Hardware
AND
SPECIALTIES IN WROUGHT IRON,
Cleveland, Ohio.



THE SWIFT MILL.

ESTABLISHED 1845.

The annexed cut shows one of the many styles of Coffee Mills of our manufacture, especially adapted to Grocers' use and all retailers of coffee. They are highly ornamental, and workmanship of the very best. We make more than 30 styles.

Also Lane's Portable Coffee Roaster

Will roast 30 to 40 lbs. at once, and can be used as a stove at other times. Send for descriptive list to Manufacturers.

LANE BROS., Millbrook, N. Y.
Also sold by leading wholesale houses.



Ludlow Valve Mfg. Co.,

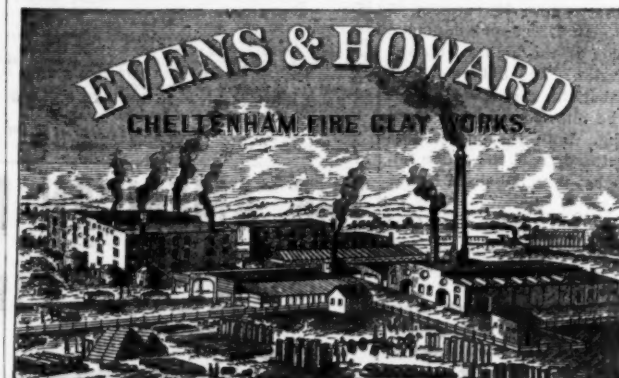
OFFICE AND WORKS:

938 to 954 River St. & 67 to 83 Vail Ave., Troy, N. Y.

VALVES

Double and Single Gate, 1/2 in. to 48 in.—outside and inside Screws, Indicator, &c.) for Gas, Water and Steam. Send for Circular.

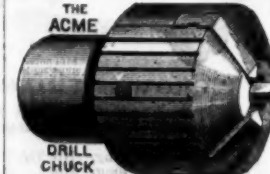
Also **FIRE HYDRANTS.**



City Office and Depot, 916, 918, 920 Market Street, ST. LOUIS, MO.

EVENS & HOWARD
CHELLENHAM FIRE CLAY WORKS.
MANUFACTURERS OF
FIRE BRICK, GAS RETORTS, BESSEMER TUYERES, FURNACE LININGS, RETORT SETTINGS of Every Description.

Dry Milled Fire Clay, Fire Sand, Ground Fire Brick in barrels and bulk, Fire Clay Sewer Pipe, Heat Pipe, Chimney Tops, Flue Linings, Drain Tile, &c.



This Chuck is new, perfect and durable. Price, \$4.25. Holds from 0 to 1/2 inch. Samples sent free by mail on receipt of price.

Address

A. F. CUSHMAN, Hartford, Conn.

Manufacturer of all kinds and sizes of

Lathe and Drill Chucks.

Orders from the trade solicited. Send for catalogue.

Towne's Pat. Liquid Bronze, in all Colors & Shades.

Patented 1870, 1872 and 1874; Improved 1875 and 1877.

For Bronzing all goods, whether of metal, plaster or wood, viz: Picture frames, ornaments, steam and gas fixtures—in fact, iron goods and wares of every description. Is easily applied by anyone. For stamping it has no equal. The Post Office and Custom House in Boston and New York Custom House were decorated with this liquid. For yacht and vessel bottoms it has no equal, having been used by the Boston Yacht Club the past four seasons, beside many others too numerous to mention.

ARTHUR TOWNE, Proprietor and Patentee, 118 Commercial St., Boston, Mass.

Send stamp for circular and price list. Agents wanted.

[Continued from page 16.]
INDUSTRIAL ITEMS.

PHILADELPHIA.
will go to Cuba, having been purchased by Spanish parties for \$13,000. The ancient towboat, Robert Morris, which was built by John Vaughn in 1832, to run on the Philadelphia and Baltimore Line via New Castle and Frenchtown, is being broken up at the I. P. Morris establishment. The same company are working 300 hands on small orders. They are putting new boilers on the tugs Tecumseh and Republic. Quite a number of other vessels are being repaired, and small vessels in process of construction at the smaller yards along the Delaware River front.

PITTSBURGH AND VICINITY.
The Keystone Bridge Company, of Pittsburgh, is to build an \$80,000 bridge at Cleveland, Ohio.

Wilson, Walker & Co., are making Safford's safety draw bar of wrought iron, of a pattern similar to the cast iron ones heretofore used. Mr. Safford says that his draw bar is in use on 146 roads.

The Leechburg Rolling Mill began to make iron for market on Monday. The tin plate portion of the works will begin operations this week.

The Soho Furnace is being rapidly put in a condition to go in blast.

The large plate referred to by us some time since as having been successfully cast by Totten & Co., of this city, has since being planned by them on one entire surface. It is believed to be the largest casting ever put upon a planer in the United States. Colonel Ford, the pioneer in the manufacture of plate glass in this country, and to whom its success is principally due, pronounces this casting the finest he ever saw, and is highly pleased with it. It has been loaded upon a railroad car specially provided at Totten & Co.'s Works. The plate, with its extension pieces, is 11 feet wide, 22 feet long and 8 inches thick, and the bill of lading calls for about 72,000 pounds finished weight.

The Edgar Thomson Steel Works have a contract for 3000 tons of steel rails from the Union Pacific Railroad. The rails are to be delivered at Council Bluffs during July, August and September.

The Pittsburgh Steel Casting Company, whose works were lately destroyed by fire, are overhauled with orders, and have hit upon a novel plan of continuing while the establishment is being rebuilt. They have procured an immense tent and propose to erect it as a covering for the men. Casting steel under a circus tent is a novelty sure enough.

The works of the Pittsburgh Encaustic Tile Company, a new concern composed of a number of English and Pittsburgh gentlemen, have two burning kilns, capable of making 45,000 feet of tiles per week, and one large slip kiln.

Messrs. Evans, Dalsell & Co. have just completed a large addition to their tube works, the building being 80x150 feet, to be used as finishing shops, adding considerably to the capacity of these already extensive works.

During the present rise on the Ohio, coal has been shipped as follows. The bushel is 76 pounds:

For	Steamers.	Barges.	Bushels.
Wheeling.....	1	10	98,000
Iron.....	1	10	200,000
Cincinnati.....	40	230	2,667,000
Madison.....	1	15	180,000
Louisville.....	12	148	1,896,000
Nashville.....	1	3	36,000
St. Louis.....	1	8	192,000
	35	421	5,269,000

L. D. Hubbard & Co. shipped a car load of their Eclipse steam pumps for oil refineries to Baltimore last week.

The Dexter Spring Co., at Hulton, have been so pressed with orders for their springs that they have been compelled to enlarge their works.

There is a strike among the boilers at Painter's, because of a rule of the mill that for every bar of iron that has clay in it 100 lbs. of iron is deducted. One man, in 11 turns of 55 heats, or 165 bars, found 2700 pounds deducted for 27 clay bars. This is the highest number, but the number varies. The boilers held a meeting and asked that the clay spots be cut out, and that they be allowed to work them over before weighing. Both the puddle boss and Mr. Painter refused, and the strike followed. The strike has been legalized by the union.

Zug & Co. have added to their factory four new nail machines for small size nails, and now have 50 machines. They have just put in two new sets of three-high muck rolls.

The works of the Jacobus & Nimick Manufacturing Company were totally destroyed by fire Thursday night. The loss is estimated at \$125,000; insurance, \$80,000. All the patterns and some finished goods were saved. The works will be rebuilt at once, and, in the meantime, temporary arrangements will be made to continue work.

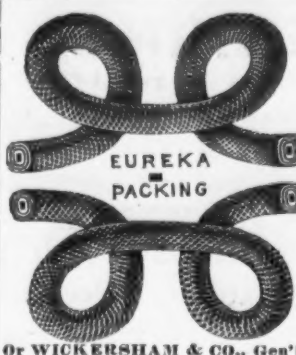
Mr. Wm. Swindel has received an order for a 24 foot Siemens furnace and two gas producers for the Burgess Iron and Steel Works, Portsmouth, O.

The last dividend of 24 per cent. to the creditors of Jas. Wood's Sons & Co. is now being paid. When the firm suspended their liabilities footed up almost \$3,000,000. There were plenty of assets, general and individual, but the principal property was the mill at Wheatland, mill at Sharon and the mill in this city. Property was greatly depreciated at this time, and the value of the mills was seriously affected. For instance, the Wheatland Works, including a mill for the production of iron rails, made up over one-half of the general assets—a value of \$1,600,000 having been placed upon the property—and yet so thoroughly depreciated were values that when the time to sell the mill came around, it was deemed almost worthless. After the payment of the individual

REFRIGERATOR
MANUFACTORY
OF
William Law,
709 & 711 Third Avenue, N. Y.
PRICE LIST.

No.	Chest.	Upright.
No. 1.....	each, \$ 5.00	\$11.50
No. 2.....	" 6.50	14.00
No. 3.....	" 8.00	16.50
No. 4.....	" 9.50	18.50
No. 5.....	" 11.50	24.50
No. 6.....	" 13.50	29.50
No. 7.....	" 15.50	35.50

Discount to the trade. Illustrated catalogue sent on application. All kinds Refrigerators made to order.



True Merit & Excellence is the Basis of all Success
THE EUREKA
STEAM AND HYDRAULIC PACKING.

The results of a long series of experiment made with a view of meeting all the requirements of a Perfect Packing. And we assert without any reservation that it is the best article of its kind yet invented. It is made of the best materials, is elastic, pliable, and does not become hard by use, consequently is easily taken out when renewal is necessary. It has a rubber center, rectangular in form, covered with a series of braids of linen, between which is placed a lubricative compound superior to anything ever before used for the purpose, and contains nothing that can in any manner cut, flake or gum the rods, no matter how long run. It has thus far received the highest praise of every engineer who has used it, and we have received many testimonials from the proprietors of Mills, Factories, Iron Works, &c., that it is the most durable, efficient and cheapest Packing they ever used. All we ask is a fair trial, knowing it will convince better than any words of ours. Orders promptly filled.

SYMONDS & CO., 120 Exchange Place, Phila., Sole Manufacturers.

Or WICKERSHAM & CO., Gen'l Agents, 403 Library St., Phila.

N. & G. TAYLOR CO.'S
EXHIBIT IN THE
Philadelphia Permanent Exposition.

We have made some extensive improvements on our exhibit in the Main Building of the late Centennial Exhibition, to such an extent that it now embraces many new and interesting features; all of which combined cannot fail but be of special service to those interested in Tin Plate and its workings. Nearly all of the articles on exhibit have been made with great care and are intended especially for our display. We have had them all attractively arranged in their proper order and position, carefully catalogued, thus making virtually the first and only, strictly complete exhibit of its kind ever presented to the public. We cordially invite all to visit it and give it a careful examination, and for further information, shall be pleased to see them at our office and stores, Branch Street, Philadelphia.

Our display embraces exhibits of the HENDY Prize Brand Tin Plate; Patent Patterns, such as Circles, Squares, Ovals, Oblongs, Octagons, Splayed, &c., showing the economy in the manufacture of Tin Plate and the saving of clippings to consumers; samples of the working of our own size 28x20 Roofing Tin; patented continuous Roofing Tin; our own special Boiler Sizes; Spouting Tin, &c.; Tinner's and Roofers' Tools and Machines of every description; Burritt's Double Seamers, showing their admirable uses; our stone-coal Tube Furnaces, for heating of soldering irons; samples of the celebrated HENDY Solder, very finest; Wire; Rivets; Roofing Nails; Black and Galvanized Sheet Iron. In addition to this our display of Minerals, Ores, &c., will be quite large and embrace most of the prominent Metals, both in their crude and finished state, such as samples of our HENDY Iron, carefully classified, showing the whole process of making this celebrated brand, from the rude ore to the polished sheet. We also have on exhibit: Pig Tin; Banca, Billiton, Straits, English, Australian, Refined; Lead; Spanish, English, Domestic; Soft and Hard Pig Brass; Antimony; Bismuth; Borax; Babbitt, Type and Yellow Metals; Copper; Lake Superior and Australian, &c., &c.

N. & G. TAYLOR CO.,
Manufacturers and Direct Importers of
TIN PLATE.
PHILADELPHIA.
Established.....1810.
Sixty-seventh Year.

The Patent Automatic Stokers

which were shown by Dillwyn Smith at the Centennial Exhibition in the British section, and obtained the medal and highest award, are now offered to the users of steam in the United States, by the "United States Automatic Stoker Co.," under a license from Dillwyn Smith, for use on land boilers, with full confidence that the satisfactory results obtained in Great Britain and on the Continent of Europe (where over 1200 of them are in use), will be fully realized here. Some of these results are: The generation of from 25 per cent. and upward of steam from a given grate surface above what is obtained from the same quality of fuel fed by hand. The lessening of the cost of steam from 10 to 30 per cent. from being able with the Stokers to properly burn a lower priced fuel. The entire removal of the smoke nuisance. The lessening of the labor of the fireman. Their use also materially reduces the temperature of the fire room and also prevents the injury to the boiler caused by the contraction and expansion of the plates resulting from the frequent opening of the fire doors in hand firing. These and other advantages have secured their introduction into the boilers of many of the largest Mills and Iron Works in England and other countries, and we are now turning out an average of 10 machines per week. A few letters are given from some of those having them in use, the statements in which can be implicitly relied upon. For information respecting price, &c., apply to

THE UNITED STATES AUTOMATIC STOKER CO.,

DILLWYN SMITH, President, 2 Chestnut St., Philadelphia.

LAND MACHINES.

From A. M. Collins, Son & Co's Factory, Third and Canal Streets, Philadelphia.

DILLWYN SMITH, Esq.—Dear Sir: After several months' experience with your Automatic Stokers, we take pleasure in stating that they have proved entirely satisfactory to us. The saving in cost of fuel we estimate at 30 per cent. increased amount of steam fully 30 per cent. beside giving us a very regular supply. The variation not being appreciable on steam gauge. Hoping you may be successful in introducing them into general use in this country, we remain, Sir, yours, truly, A. M. COLLINS, SON & CO.

Wigan Coal and Iron Company.

Dear Sirs: I have pleasure in certifying that the

Stokers applied to our boilers at Kirkless have worked to our satisfaction, and have effected a saving in fuel. Be good enough to put in hand a x more for the range of boilers at our Alexandria Fil.

I remain, yours, truly, W. H. HAWLETT.

From J. R. Jones, Esq., Afonwen Paper Mills, Holywell. Your Stokers answer my purpose; without them I could not have obtained that regular supply of steam throughout the day. I formerly used coal; with the Stoker I use slack, and save fully 25 per cent. in cost of fuel. They are suitable for all boilers.

The Earl of Dudley's Round Oak Works, Birmingham, 6th March, 1876.

I have much pleasure in stating that the Stokers you have fixed at these Works are giving most satisfactory results. The first you put down convinced me that we

could use it for burning the fine sluffings or dust from the slack; and those you have since erected have fully confirmed us in that opinion, for not only do we now use the sluffings we could not previously burn at all, but the generation of steam is so rapid that we have discontinued using one of the boilers, finding we can obtain, by the aid of your Machine, quite as much steam from three boilers as we previously could from the four.

Yours, truly, R. SMITH CARLSON.

Hurst Mills, Ashton-under-Lyne, 26th September, 1875. Dear Sirs: We have had your Patent Mechanical Stokers in our use for some time, and find they work to our entire satisfaction, and effect a considerable saving in coal.

Yours, respectfully, CLUDMAN WHITTAKER & SONS,

Per W. TROOP.

Note.—They have ten double Machines at Work.

THE AMERICAN MACHINE COMPANY, Philadelphia, Pa.,
MANUFACTURERS OF
SPECIALTIES OF LIGHT IRON WORK.



CROWN WRINGERS,

with Patent White Rubber Rolls, Galvanized Malleable Iron Frame Work, Bessemer Steel Springs, &c. Noted for Strength, Durability, Efficiency and Simplicity.

No. 2, Rolls 1 1/2 in. diam., 10 in. long. No. 2 1/2, Rolls 1 1/2 in. diam., 12 in. long. No. 3, Rolls 1 1/2 in. diam., 12 in. long. No. 4, Rolls 1 in. diam., 12 in. long.



CROWN FLUTING MACHINES,

with valuable improvements over other style Machines. Patent Spring Arrangement and Clamping Device. Noted for Superiority of Finish and Practical Advantages. The leading Machine in the market.

Sizes (length of Rolls), 4 1/2 inch, 6 inch and 8 inch. Rolls with 10, 12, 15, 18, 22, 26 and 30 Stutes.



A PORTABLE
FIRE ESCAPE

For Every Family. Approved and recommended. Centennial Medal and Diploma. Send for illustrated circular to E. F. Fiske, 60th Street, Near Third Ave., New York City.

For sale by the Hardware and House Furnishing Stores.

RHODE ISLAND HORSE SHOE CO.,
OFFICE, 51 Canal Street, Providence, R. I. WORKS at Valley Falls, R. I.
Manufacturers of
PERKINS and RHODE ISLAND PATTERNS of
HORSE AND MULE SHOES.

debts and a 10 per cent. dividend to the general creditors, the bankrupts then tendered an additional 24 per cent., and their creditors, some 500 in all, accepted the same, and in pursuance thereof, the payments were begun. The total amount paid the creditors when the composition is closed will be shown by this exhibit:

Individual debts—in full.....	\$250,000
General debts, 10 per cent.....	230,000
General debts, 24 per cent.....	550,000
Total.....	\$1,030,000

MARYLAND.
A portion of the bar mill at Cumberland has started up.

WEST VIRGINIA.
All the Wheeling mills are in full operation. The Hardman furnaces are being repaired.

OHIO.
At Niles all the mills are running full except Falcon and Ward's old mill.

The Star Glass Works, of Newark, commenced work again May 10, after a stoppage of seven months, caused by the glass blowers' strike. They now employ non-union men, and are running full blast. They employ 120 hands and are making 70 gross fruit jars and 30 gross bottles daily.

The Girard Furnace still continues in blast, producing about 50 tons of No. 1 iron per day. The Akron Mill is in full operation.

New coal and ore docks are being constructed near the Cleveland Iron Company's Works, Cleveland.

The foundry and manufactory of Lowrie, Shurmer & Allen, Cleveland, is being operated with 23 men. They make a large number of parlor grates, gray iron castings, etc., taking nickel plating as a specialty.

In the old rod mill, Cleveland, within nine hours, 37,850 pounds No. 4 rods, which is a little over 3-16 of an inch in diameter, were turned out recently. Stretched in one continuous rod this amount would reach 57 miles.

It is stated that the Alliance Rolling Mill will soon be in operation. Is this the periodical rumor, or is it "honest Injun" this time? It was lately sold for \$9200.

J. Tudor, trustee for John Cooper & Co., of Mt. Vernon, is rapidly getting the affairs of this firm settled up, and expects in a few weeks to have the machines working again running on full time.

The Columbus Elbow Co. are turning out 50 dozen elbows daily. New machinery is being added by which their elbow is much improved in appearance.

The Ohio Brush and Wire Works are about to be removed from Columbus to Chicago. The machinery is now being set up in the Joliet Penitentiary, and by July 1st everything will be in full blast in the new quarters.

The works of T. J. Nottingham & Co., at Cincinnati, are running full upon brass and iron steam, gas and water fittings and brass castings of all kinds. They are manufacturing Walker, Pratt & Co.'s cast iron sectional safety steam boilers and improved apparatus for warming and ventilating dwellings with hot water. They have just made one of the steam apparatus for the works of the Meador Furniture Company; one for H. F. West, Bro. & Co., queensware house; one for Houck's German Theater, and one for R. Johnson & Son, starch manufacturers, Cincinnati. Also several hot water heating apparatus for residences in Cincinnati, and for their own works and office. They have been quite successful with this apparatus, and expect a number of large orders this year from Sandusky, Bay City and other places. They are also introducing Wood's patent apparatus for drying lumber.

At Ironton the Lawrence and the Belfont mills are running, but the Iron and Steel Mill is silent.

Hamden Furnace is in operation. The Portsmouth Foundry and Machine Works are at work on the new Whitwell hot-blast ovens for the two Ashland (Ky.) Furnaces. The Norton will put up four and the Ashland three. The ovens will measure 16 feet in diameter by 35 in. high.

Monroe Furnace is making 15 to 16 tons per day. Ohio claims 18 tons No. 1 charcoal per day.

Mt. Vernon Furnace has been in blast for nearly a month and is doing admirably, making from 14 to 17 tons No. 1 iron. From \$1.50 to \$2 is paid for ore on the bank. There the different ores are burned in separate kilns, each quality to itself. Large quantities of ore are received for Campbell's new Ironton Furnace.

MICHIGAN.
It is probable that the Bay Furnace will be rebuilt at some time in the near future, the company owning a large amount of hard wood land in its vicinity, and the machinery, boilers, etc., not being very badly damaged. The engines were supported by timber, which burned, thus allowing them to settle, breaking the connection pipes, etc. The entire loss to the owners is not nearly as large as first reported. The main injury, of course, falls on the people who relied on the furnace for support. Some 60,000 bushels of charcoal were consumed on the furnace bank.

ILLINOIS.
The Belleville Nail Works (J. C. Waugh & Bros., lessees; Gen. W. H. Powell, general manager), resumed operations November 1, 1876, and closed work June 13 to repair boilers, &c. The mill has 45 nail machines. Product during the run, 78,882 1/2 kegs of nails. The works have been operated under a new process invented and patented by Gen. Powell, in which railroad iron has been very successfully utilized. Operations will be resumed as soon as repairs are completed.

MISSOURI.
Nearly all the foundries in St. Louis are idle. Vulcan furnaces Nos. 1, 2 and 3 are running on Bessemer iron. It is stated that there has been a great improvement in the quality of the pig lately by the use of Pilot Knob ore.

WISCONSIN.
The following is the report for May of the assignee of the Milwaukee Iron Company:

May 1, amount on hand as per report of this date.....	\$43,512.96
June 1, amount received from all sources during the month of May.....	19,857.50
Total.....	\$63,370.46
Amount disbursed.....	964.52
Balance.....	\$62,405.94
Deposited in Milwaukee National Bank.....	\$62,074.99
On hand.....	\$331.95
Total.....	\$62,406.94

TENNESSEE.
Taking the average for four months, the cost of making a ton of pig iron in the Chattanooga Furnace is about \$14.50. So says the Dispatch of that city.

Russell's Patent Parallel Pliers.

We present herewith a recent improvement in pliers, under the name given above, which satisfies a want that has long been felt in every workshop in the country. The defects of the old styles are so numerous that they have been almost entirely superseded by the hand vice, although admitting of much quicker adjustment in the manipulation of light work.

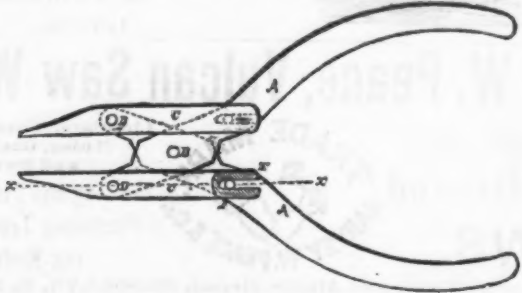
The new instrument was originally designed for the jewelry trade, and was at first manufactured by Messrs. Hagstoz & Thorpe, watch case makers, Ledger building, Philadelphia, for use in their own special line, but it at once so clearly proved its efficiency, and the demand for it became so great that steps were immediately taken for supplying it in a variety of forms and sizes to the hardware trade also.

The principle of its operation is clearly shown in the accompanying illustration. The pliers consist of four distinct parts, the two jaws C, and two handles A. The handles are pivoted at the point B, and close the jaws by pin connections at the points D. There is, however, in addition a guide pin in each handle on the other side of the point B, and at the same radial distance from it as the points D. As each pair of pins lie in a horizontal line x x, parallel to the other pair, and as all four pins are equally distant from the central pivot they approach the center line, when the handles are closed, with the same angular velocity, and maintain the parallelism of the jaws in every position. The guide pins move in slots, and thus furnish an adjustment for the increased or diminished distance between the pins, arising from the approach or recession of the jaws.

The whole arrangement is simple and ingenious, and accomplishes the desired object by a positive motion, without involving any great

the territory named, beside innumerable extensions of pipe lines in these towns and cities. The quality of the pipes made by this reliable firm commends itself to all, as their standard of excellence has not been surpassed anywhere—a fact that Louisville may well be proud of—and at the very low prices of iron now ruling here, they are full of work at a season when universal dullness is met elsewhere, the one result of the general depression being to put the construction of gas and water works within reach of towns that could not afford it at the rates iron sold for three or four years back. It is a most interesting sight to see the operation of making pipes on the vast scale to be seen in their foundries. The ease and celerity with which the numerous kettles of melted iron and the huge castings are handled, seem almost marvelous. During the year the Union Pipe Works have been awarded the contracts for all the street mains to be laid during the season in Chicago, Cincinnati, Indianapolis, Winona, Minn., Bloomington, Ill., Salt Lake, Utah, Dallas, Texas, and twelve other cities. They have also contracts for the gas mains for some cities and many new gas and water works now being built. This firm have two rules they universally observe, viz.: To sell as low as any, and to warrant all of their pipe before and after being laid in the ground for use. They are now about completing a contract with the Louisville Water Company of 5000 tons 30 to 36 inch cast iron pipes. Some idea of the extent of their operations and the capacity of the works may be formed by the fact that in 1875 Dennis Long & Co. melted 23,000 tons of metal, and in 1876, 16,000 tons.

The Ore Trade on the Western Lakes.—Ahtabula.—13,991 tons of ore were received at this harbor during the seven days from June



intricacy of mechanism or liability to derangement. The pliers are compactly made, and the working parts being protected by the jaws are not exposed to dirt. The other advantages claimed are numerous. It will be at once apparent that in gripping anything the extent of surfaces in contact will be much greater than in old forms, and consequently from the distribution of pressure, much more power may be applied to the handles without breaking the jaws, as sometimes happens in ordinary pliers when they are not tempered to precisely the proper point. Hence, the improved pliers are stronger, while the same amount of power gives a much securer grasp of the article, and prevents it from sliding about, which it is difficult to avoid where it is held at but a single point. Again, the range of grasp is much greater, for the reason that when pliers of the usual form are opened to any extent the angle of the jaws becomes so great that they have a constant tendency to thrust the article outward from their hold. In overcoming this defect the present instrument becomes invaluable as a means of holding pins, especially by their ends; plates while drilling, and the small gear wheels of watches while being operated upon, as the extended bearing avoids concentration of pressure at any particular point, and thus prevents the abrasion and defacement of delicate work.

The different parts of the instrument are drop forgings made, we are informed, of the very best steel, afterward shaped to standard gauges in accordance with the duplicating system, and thus any piece can be readily replaced, while accuracy of fit is insured at the same time. This construction is also applied to shearing pliers, draw tongs and to a punch much used on main springs of watches. It is obvious that the motion obtained from this mechanism is far superior to the ordinary shoemakers' punch, which, from its radial motion, makes holes necessarily angular and untrue.

The improved plier is already very popular. They are slightly more expensive than the ordinary forms, but it is expected, by improved machinery for their manufacture, to turn them out in such numbers that the difference in price will be but trifling.

Messrs. Hagstoz & Thorpe are the sole proprietors of this improvement, and have also constructed a vice on the same principle. By simply pushing the jaws, they may be instantly adjusted to work of any size within the capacity of the vice, and then tightened by a slight turn of a lever so arranged as to jam the outer jaw against the inner.

The Louisville Commercial says: A Louisville enterprise that has become famous for the excellence of its manufactures and the far-reaching extent of its operations, is found in the mammoth cast iron pipe works of Dennis Long & Co., whose productions in this line exceed that of any similar establishment west of the Allegheny Mountains, and rival in facility of production and quantity, as well as quality, any pipe works in America. This establishment is to-day supplying nearly all the pipe being used in gas and water works in fourteen of the Northern, Western and Southern States, as well as the territories. They make on an average 90 tons of pipe per day, employing 280 men, and during the last eight years have supplied the original pipes and branch castings for gas and water works in 132 towns and cities in

7th to the 13th. Cleveland.—The Review says: "There were 33,672 tons of iron ore received at this port during the week ending June 10th, 800 tons of which were from the Lake Champlain district and the balance from Lake Superior. The previous receipts of the season were 54,878 tons, making the total 88,550 tons. Of the total 4276 tons came from the Lake Champlain district." Lake Superior.—The following table shows the shipments of iron ore from the Lake Superior region up to and including Wednesday, June 13:

	Gross tons.
Marquette	113,200
Escanaba	11,729
Escanaba	100,794
Total	225,723

Mr. William Wright, of Newburg, N. Y., has recently shipped the largest horizontal engine ever built at his shop. It was built for a rubber factory located at New Brunswick, N. J. The cylinder is 30 inches in diameter, with a stroke of 5 feet. The fly wheel is 20 feet in diameter and weighs 40,000 pounds. It will make 53 revolutions per minute. The engine is rated at 450 horse-power, but is capable of something higher. It has Wright's patent automatic cut-off, and the bed plate and gearing are of patterns on which Mr. Wright has patents. The bed plate has no angles, and the lines all approximate the arch form. Mr. Wright claims for his engine a remarkable economy in the use of fuel, a simplicity of construction, uniformity of speed under great extent of labor and other desirable qualities. He has at this time numerous orders for all the smaller sizes than that spoken of above, and several more engines of the same style are now in process of construction.

Among the machinery shipped by the Illinois to Liverpool recently was a large wagon or coal scale, with patent double beam, of 15 tons capacity, from Rieble Brothers. We believe this is the first shipment of scales of this kind to England from this city. The Rieble Bros. have been busy for some time filling orders for their self-adjusting railroad track scales, of 80,000 pounds capacity, to the Western and Atlantic Railroad Company, of Georgia, and the Cleveland Iron Company; scales and testing machines for the Lehigh Valley Railroad Company, Baltimore and Potomac Railroad Phoenix Iron Company, Brooklyn Bridge Company, Louisville Bridge Company, Ohio Agricultural and Mechanical College, Eastern Railroad Association and others.

Messrs. W. C. Allison & Co., of West Philadelphia, the car builders and tube manufacturers, are now running with 800 men, remodeling refrigerator cars, constructing narrow gauge cars for railroads in South America, and making pipe for various oil lines in the northwestern part of the State. At their wharf on the Schuylkill there are at present two large schooners receiving their cargoes of locomotives, which are being shipped to Brazil as fast as they can be loaded.

The Legislature of Pennsylvania at its last session passed a bill for the appointment of mine inspectors in the bituminous region. The duties of this office are those usually belonging to such positions, and are of a very delicate nature, requiring not only knowledge, intelligence and skill, but freedom from preju-

dice either for or against the miners or operators. The inspector should have the good will and respect of both. And in the face of this the Labor Tribune has the assurance to recommend the appointment of a man—who is no doubt fitted, so far as acquisitions are concerned—because he has in the past incurred the ill-will of the employers. It says: "We are proud, and the miners at large should be proud of Alexander Bowie. He did most to get the bill passed, and now stands at the head of the class. He deserves the appointment. He has always been a staunch union man. For his devotion he has incurred the displeasure of his employer. He has the hearty support of nine-tenths of the miners." If Alexander Bowie is defeated—as after this he should be—it will be done by his over zealous friends.

The Chadborn & Coldwell Manufacturing Company, of Newburg, N. Y., have been quite successful in building up a trade in Europe for their new Excelsior lawn mowers. They have sent over 600 to England this year, and now have a large order on hand from Germany. The president of the company is at present in Europe, seeking to extend their trade in other directions.

Messrs. Chas. W. Ervien & Co., of Philadelphia, have just shipped to Mexico a large steam engine, built by them on an order from a firm in that country. They have several important orders on hand, and report quite an active inquiry for large steam engines.

Special Notices.

WANTED.—An engagement as local or traveling salesman to represent one or more manufacturers. Has had ten years' experience and an extensive acquaintance among the jobbing Hardware and Tinners' stock trade in the Middle and Western States. Address D. A. F., Office of The Iron Age, 220 S. 4th St., Phila., Pa.

WANTED.—A Partner in the Brass Business. One who will purchase one-half interest in two very valuable patents, which have over 15 years to run, and is introduced on over 30 railroads in the United States. Business pays over 80 per cent., and is steadily increasing. Only about \$4000 required. Address Brass Co., Office of The Iron Age, 220 S. 4th St., Phila., Pa.

FOR SALE.
Rogers Iron Furnace.

By virtue of a deed of trust made to me by the President and Directors of "The Rogers Iron Company," of Georgia, under the powers given to them by the charter, and by a unanimous vote of the stockholders, held on the 30th day of April, 1877, I will sell at public outcry at the Furnace, at Rogers' Station, on the Western and Atlantic Railroad, at Cartersville, Georgia, on the first Tuesday in July, 1877, at one o'clock p. m., to the highest bidder, all the property of the said Company, as follows, to wit: Fifteen acres of land on the east side of lot number 130, in the 4th district and 3d section of Bartow county, Georgia, on which is situated the Furnace Stack, 33 feet at base, 14 feet at top, 35 feet high, with three tiers arches; Engine House, and engine, 75 horse power, 8 feet stroke; two boilers, 40 feet long, 3 feet diameter, with blowing cylinder, and cast iron air reservoir; one ore crusher, and all the piping and fixtures; one ten-ton scale; and all the machinery and tools owned by the Company, including four wagons, one dory, etc.

On said fifteen acres are also an ore house, coal house, casting house, store house and fixtures, 11 operative houses, one barn and stables and black smith shop and tools.

On this property is sand stone, lime stone and iron ore.

Also the following lots of land: Lots 167 and 168, 5th district and 3d section, Bartow county; 73, 75, 143, 144, 4th district and 3d section, Bartow county; all the mineral interest in lots 138, 304, 320, 4th district and 3d section; one-half of mineral interest in lot No. 198, 4th district and 3d section, Bartow county, Georgia, and the lease old interest in lots 230, 275, 203 of said district and section, together with all the property of every kind and character said Company owned, and all and every right it may have either at law or in equity.

I will sell all the property as described in said deed of trust, and make conveyance thereby. Said deed is in my possession at Atlanta, Georgia. This is one of the best sites for making iron in the South, and the property will be sold to the highest bidder.

TERMS.—One-half cash; balance in six months, with interest at seven per cent.

W. C. MORRILL, Trustee.

ATLANTA, GA., June 13, 1877.

MACHINE TOOLS,
Second-Hand and New

SECOND-HAND TOOLS.

Two Engine Lathes, 20 in. swing, 8 ft. bed, N. Y. S. E. Co.'s make.
Two Engine Lathes, 22 in. swing, 8 ft. bed, N. Y. S. E. Co.'s make.
One Engine Lathe, 76 in. swing, 36 ft. bed, N. Y. S. E. Co.'s make.
One Iron Planer, planes 70 in. wide, 53 in. high, 27 ft. long, N. Y. S. E. Co.'s make.
Also a large number of Lathe Chucks, N. Y. S. E. Co.'s make.
One Screw Cutting Lathe, 13 in. x 35 ft.; one Screw Cutting Lathe, 14 in. x 35 ft.; one Engine Lathe, 18 in. swing, 8 ft. bed; one Engine Lathe, 22 in. swing, 16 ft. bed; one 36 in. x 29 ft. Planer; three 15 ft. x 25 ft. Screw Cutting Lathes; one Crank Planer; three 21 in. swing Upright Drills; three 4 spindle drills; four common Milling Machines; one Brown & Sharpe Universal Milling Machine; one 24x24x25 ft. Planer; one 8 in. Shaper; one Gear Cutter; one Riding Machine; one 2 Spindle Profiling Machine; one "Davy Bro." 1300 lb. Steam Hammer; one "Ferris & Miles" 2000 lb. Steam Hammer.

NEW TOOLS (N. Y. S. E. Co.'s make):
One Engine Lathe, 14 in. swing, 9 ft. bed; four Engine Lathes, 30 in. swing, 8 ft. bed; one Engine Lathe, 30 in. swing, 10 ft. bed; one Engine Lathe, 32 in. swing, 15 ft. bed; three Iron Planers, 30 in. wide, planes 4 1/2 ft. long; one Iron Planer, 30 in. wide, planes 5 ft. long; one Iron Planer, 36 in. wide, planes 5 ft. long; two Upright Drills, 6 in. swing, very heavy; two Shaping Machines, 8 in. stroke. Also one Wright patent cut-off Engine Cylinder, 14 in. diam., 25 in. stroke.

The above tools will be sold very low, and can be seen at

The George Place Machinery Agency,

121 Chambers and 103 Reade Sts., N. Y.

WANTED.—A first-class business man familiar with machinery and manufacturing, capable of handling large bodies of men, desires a responsible position. References satisfactory. Address, IRON AND STEEL, Care of P. O. Box 513, Bridgeport, Conn.

Special Notices.

NOTICE.

To whom it may concern:

Constructors and users of Screw Machinery are hereby notified that the following re-issued Letters Patent have been granted to the American Screw Company, assignees of Hayward A. Harvey.

No. 7344.—Improvement in Machines for "Shaving the Heads of Wood Screws," dated Feb. 27, 1877 (original Patent, of which this is a re-issue, dated Oct. 18, 1864).

No. 7373.—Improvement in Machines for "Threading Wood Screws," dated March 27, 1877 (original patent, of which this is a re-issue, dated May 17, 1864).

No. 7374.—Improvement in Machines for "Nicking the Heads of Screw Blanks," dated March 27, 1877 (original Patent, of which this is a re-issue, dated May 17, 1864).

The above inventions relate to that class of Screw Machines in which the screw blanks are successively inserted in receivers arranged radially upon a hub, which has an intermittent rotating motion, and a reciprocating motion in a right line.

Any parties constructing or using machinery involving the subjects of invention set forth in said three re-issued patents, will expose themselves to prosecution for infringement.

AMERICAN SCREW CO.

PROVIDENCE, May 22, 1877.

Wanted—A Partner,

In a foundry and machine business, already well established. Locality splendid and healthy.

A practical man with means is wanted to join a practical man who is already well established.

Address CAR WHEEL FOUNDRY, P. O. Box 134, Selma, Alabama.

For Sale.

A stock of Builders' Hardware, Stoves, Tinware and Tinners' Tools, in an old and desirable stand. Stock light and few unsalable goods. Terms easy. Price low. For further information, address

BUCKLAND & DILLON,

Fremont, Sandusky Co., Ohio.

A Young Frenchman,

aged 21, who has served in Paris as apprentice for the hardware trade, and is actually engaged in a merchant's office in Birmingham (England), wishes to find a situation as foreign correspondent and general assistant in a first-class American firm. Very satisfactory references from present and former employers. Address FRENCH, Office of The Iron Age, 83 Reade St., N. Y.

Hardware Business.

FOR SALE.—An old stand, facing two streets; rent low; good help, and doing a prosperous business; large back country; the best reasons for selling. Address

G. M. BRUBAKER,

Millersburgh, Dauphin Co., Pa.

Engines & Machinery.

One 12x40 in. fixed cut-off Engine; one 12x36 in. Green cut-off; two 10 h. p. Baxters; one 4 h. p. do.; one 6 h. p. Baxters, without boiler; one 8x20 in. hor. poppet valve do. All in perfect order and good as new. Prices low.

One No. 3 Pratt & Whitney Screw Machine; one 13 in. x 4 ft. and one 16 in. x 3 ft. Pratt & Whitney Lathes with taper; Brown & Sharpe Milling Machine; Upright Drill; and a general assortment of Machinery tools.

520 ft. 3/4 in. English Linen Hose at a bargain.

The Bullard Machine Co., Limited,

14 Dey Street, New York.

Ramsey's Car Truck
Shifting Apparatus.

The advantages gained by using Ramsey's Car Truck Shifting Apparatus, are as follows:

1st.—The power required to run a car on the level track is sufficient to separate the trucks from a car body.

2d.—It avoids twisting or straining the car frames.

3d.—The manufacturing cost of this Shifting Apparatus will not exceed one hundred dollars. And each one is capable of doing more work with less strain to the car, and without the assistance of an extra Steam Engine, than a Steam Hoist, costing twelve hundred dollars.

At each one of the principal stations where car wheels are regularly tested to see how they stand the journey, a switch is placed, having a depression or pit about eighteen inches deep, with gentle inclines at each end, and on each side a narrow track, remaining on the level, upon which is small but strong trucks, designed to carry supporting beams or cross-bars extending from one to the other across the pit, for the purpose of bearing the car body, while the trucks run down the incline rails to the pit.

A Working Model of this Apparatus is on exhibition at

220 S. Fourth Street, Philadelphia, Pa.

Communications may be addressed to

RAMSEY & SCARLETT, as above, or to

Box 162, Cobourg, Ontario, Canada.

See The Iron Age of Sept. 7, 1876.

INVENTIONS.

Responsible parties wishing to reduce inventions to practice can find just the opportunity they require, as regards low cost, first-class mechanical skill and facilities, combined with practical knowledge and successful experience in this line, by applying to the

ATWOOD MACHINE CO.,

Stonington, Conn.

SPECIAL NOTICE.

The undersigned offer their services as agents to

American Producers of Metals.

They represent foreign brands of Zinc, Russia Iron, Hoop Iron, Window Glass, Cutlery and Guns.

LOUIS WINDMULLER & ROELKER,

90 Reade Street, N. Y.

NEW

Stiles & Parker No. 5, Geared Punching Press,

FOR SALE CHEAP.

B. D. WASHBURN & CO., Boston.

Special Notices.

CHARLES OTTO,

P. O. Box 1199.

(ESTABLISHED 1864.)

Importer & Dealer in HARDWARE, Manufacturers' Agent, etc.

19 & 14 Front and 250 & 252 Market Sts., San Francisco.

I am prepared to make arrangements with Eastern manufacturers to act as their agent for the sale of Hardware, etc., on the Pacific Coast.

REFERENCES:

Sargent & Co., 37 Chambers Street, New York.
Van Wagoner & Williams, 88 Beekman St., N. Y.
T. Heesenbruch & Co., 10 N. 5th St., Philadelphia.
The Pennsylvania Tack Works, Norristown, Pa.
The Pacific Bank, San Francisco.

C. W. MAY, FIRNHABER & CO.,

PARIS,

American Commission Merchants, Agents for Exhibitors at the French Exhibition of 1878. Sales of American Goods effected in Europe. For a circular or Special Information address their representative, A. W. MORTON, 22 Platt St., New York.

Export to Germany

And Surrounding Countries.

Agency for Soliciting Patents

In the German Empire.

See the new Patent Law published in full in The Iron Age of June 21, 1877.

Hammacher & Delius,

HAMBURG, GERMANY.

Dealers in exclusively American Hardware, Agricultural Implements, House-Furnishing Goods, &c. HOUSE IN NEW YORK, A. HAMMACHER & CO.

Wanted to Purchase,

Second-hand Steam Engine, 12 or 14 inches diameter of cylinder, of the latest and most improved pattern.

Address P. O. Box 92,

Vicksburg, Mississippi.

SPECIAL NOTICE.

I have three patents for Dies, Machinery and Tools for making Augers and Bits, each running seventeen years; dated as follows: Dec. 19, 1865; January 31, 1866, and July 3, 1866. There is a special claim on each of the dies. All persons infringing on said patents will be held responsible to the extent of the law. Russell Jennings.

DEER HIVEN, Conn., Sept. 7, 1874.

RESIDENT BUYER.—A gentleman of more than twelve years' experience in the general hardware business, and for several years past acting as buyer of the entire stock of one of our large Eastern wholesale houses, will make arrangements to act as buyer for a few Western or Southern correspondents. Thoroughly understands the requirements of both markets, and being constantly in communication with all Eastern manufacturers, offers his services in this behalf. Best of references furnished. Address G. U. S., P. O. Box 4713, New York City.

Palmer, La Grange & Duval,

SHAWNEE, OHIO.

Furnace Builders & Mining Engineers,

Will contract for the construction of Furnaces complete and in blast, or furnish drawings, specifications and give general instructions. Will put in stoves and machinery of any description that may be required. Information for furnace locations can be obtained at our office in Shawnee, on application by letter.

JOS. PALMER. H. LA GRANGE. B. F. DUVAL.

DROP FORGINGS.

The TRENTON VISE & TOOL WORKS, Trenton, N. J., having increased their facilities, are now able to do all kinds of

Iron and Steel Drop Forgings

in quantities to order at reasonable rates.

HERMANN BOKER & CO., Proprietors.

101 & 103 Duane St., N. Y.

Wanted,

In an established wholesale Hardware and Cutlery House, Salesmen having a trade of their own, who will travel on commission.

Apply by letter to C. F.,

341 West 28th St., New York.

A DRAUGHTSMAN AND DESIGNER wishes a situation in an Ornamental Iron Works Establishment. Any part of the country.

Address, stating terms, G. B.,

Office of The Iron Age, 83 Reade St., N. Y.

For Sale,

Hopkin's Patent Circulating Boiler and mode of applying boilers to ranges.

State and county rights for sale.

William Hopkins, Jr.,

4909 Gtn. Avenue, Philadelphia.

STEAM HAMMER.

Wanted,

A small second-hand Steam Hammer. Address, with full particulars,

NAYLOR & CO.,

Boston, Mass.

Important to Manufacturers.

BISSELL, WELLES & MILLET,

Auctioneers and Commission Merchants, No.

15 Murray St., New York.

Solicit from Manufacturers and others consignments of Hardware and Cutlery for our weekly Auction Sales to the Trade, or at private sale for cash, as desired. Our facilities for moving large lines of goods are unsurpassed. Advances made if desired.

TO LET,

A Light, Handsome Office.

Possession Immediately.

HERMANN BOKER & CO.,

1

Trade Report.

Office of The Iron Age.
WEDNESDAY EVENING, June 20, 1877.

During the past week the financial markets have been without feature of general interest. The money market continues very easy and abundantly supplied. Borrowers on call are freely accommodated at 1 to 2 per cent. The rate of discount on prime mercantile paper is 3 to 4 per cent.

The gold market has been quiet and without feature. We give below the daily range of the premium:

	Highest.	Lowest.
Thursday.....	105 1/2	105
Friday.....	105 1/2	105
Saturday.....	105 1/2	105
Sunday.....	105 1/2	105 1/2
Tuesday.....	105 1/2	105 1/2
Wednesday.....	105 1/2	105 1/2

Government bonds have been quiet and in their fluctuations have sympathized with gold. The syndicate which have charge of the 4 per cent. 30 year bond negotiation have opened the loan to popular subscription for thirty days, the last of which is July 16th, at par and accrued interest from July 1st, the date of the bonds. Buyers can pay for the bonds either at the time of subscription or any time prior to October 16th, next. Forms of application can be had at the Treasury office, at the national banks and the more prominent private bankers all through the country. Subscriptions for the coupon bonds are limited to the denominations of \$50 and \$100, while the denominations of registered bonds obtainable range from \$50 to \$10,000. These bonds run thirty years, and in this particular are the best bonds yet issued by the government; they are free from all forms of taxation, paying interest quarterly, and where the bonds are registered holders have the interest sent to them by mail. Bankers not in the syndicate, as well as those in it, express the opinion that the popular subscriptions will be large, particularly if the price of gold declines or does not advance from present figures.

State bonds are dull and steady; railroad mortgages strong and quiet. The stock market continued feverish, as last reported, until the announcement of a settlement of differences between the trunk line managers imparted a stronger tone to the market. The coal stocks continue much depressed. The principal dealings of the week have been in Lake Shore, D. & W., New York Central, Western Union and Michigan Central.

The American Mining Board some time ago made a proposition to merge their organization into that of the New York Mining Stock Exchange. This has at last been accepted, and the consolidation will be effected in about a fortnight. The name and organization of the New York Mining Stock Exchange will be retained.

The following is a comparison of the averages of the New York banks for the past two weeks:

	June 9.	June 16.	Differences.
Loans.....	\$251,973,000	\$250,687,500	Dec. \$1,285,500
Specie.....	19,441,700	18,322,100	Dec. 1,119,600
Legal tendrs.....	85,078,100	86,360,000	Inc. 1,281,900
Deposits.....	223,728,500	222,665,800	Dec. 1,062,700
Circulation.....	16,162,000	15,971,000	Dec. 191,000

The foreign trade movements for the week are shown in the following tables:

	1875.	1876.	1877.
Total for week.....	\$4,083,961	\$5,733,733	\$8,297,910
Prev. reported.....	165,128,716	143,272,663	148,482,479

Since Jan. 1..... \$169,812,677 \$149,006,396 \$156,780,389

Included in the imports of general merchandise for the week are the following:

	Quant.	Value.
Brass goods.....	15	\$3,151
Bronzes.....	8	1,680
Chains and anchors.....	30	1,230
Cutlery.....	55	11,036
Guns.....	5	1,413
Hardware.....	75	1,225
Iron, pig, tons.....	400	6,745
Iron, sheet, tons.....	21	1,968
Iron cotton ties.....	106	398
Iron tubes.....	100	500
Iron, other, tons.....	788	23,927
Iron ore, tons.....	200	334
Lead, pigs.....	210	5,371
Metal goods.....	84	8,142
Nails.....	5	113
Needles.....	14	7,597
Old metal.....	1	686
Per. caps.....	17	2,391
Saddlery.....	16	1,368
Steel.....	409	9,588
Tin, boxes.....	38,303	177,968
Tin, 423 slabs.....	31,200	3,592
Wire.....	24,493	2,493
Zinc.....	1	1,226

EXPORTS EXCLUSIVE OF SPECIE.

	1875.	1876.	1877.
For week.....	\$3,697,019	\$5,333,965	\$4,820,173
Prev. reported.....	110,594,324	114,036,634	145,594,001

Since Jan. 1..... \$116,533,343 \$130,290,599 \$130,754,174

EXPORTS OF SPECIE.

	1875.	1876.	1877.
Total since Jan. 1.....	\$17,191,739	\$17,191,739	\$17,191,739
Same time in 1876.....	36,836,481	36,836,481	36,836,481
Same time in 1875.....	36,836,481	36,836,481	36,836,481
Same time in 1874.....	36,836,481	36,836,481	36,836,481
Same time in 1873.....	36,836,481	36,836,481	36,836,481
Same time in 1872.....	36,836,481	36,836,481	36,836,481

Government bonds close as follows:

	Bid.	Asked.
U. S. Currency 6s.....	122 1/2	123 1/2
U. S. 6s 1881, reg.....	110 1/2	111 1/2
U. S. 6s 1881, cou.....	110 1/2	111 1/2
U. S. 6s 1882, new reg.....	109 1/2	110 1/2
U. S. 6s 1882, cou.....	109 1/2	110 1/2
U. S. 6s 1887, reg.....	109 1/2	110 1/2
U. S. 6s 1887, cou.....	109 1/2	110 1/2
U. S. 6s 1892, reg.....	111 1/2	112 1/2
U. S. 6s 1892, cou.....	111 1/2	112 1/2
U. S. 6s 1898, cou.....	113 1/2	114 1/2
U. S. 10-40 reg.....	113 1/2	114 1/2
U. S. 10-40 cou.....	113 1/2	114 1/2
U. S. 5s 1881, reg.....	111 1/2	112 1/2
U. S. 5s 1881, cou.....	111 1/2	112 1/2
U. S. 4 1/2s 1891, reg.....	107 1/2	108 1/2
U. S. 4 1/2s 1891, cou.....	107 1/2	108 1/2

The following are the closing quotations of active stocks:

	Bid.	Asked.
Atlantic and Pacific Telegraph.....	18 1/2	19 1/2
Chicago & Northwestern.....	20 1/2	21 1/2
Chicago, Rock Island and Pacific.....	40 1/2	41 1/2
Chicago, Burlington and Quincy.....	23 1/2	24 1/2
Col. Chicago and Ind. Central.....	1 1/2	1 3/4
Clev., Col., Cin. and Indpls.....	22 1/2	23 1/2
Cleveland and Pittsburgh.....	76	77 1/2

Chicago and Alton.....	79 1/2	80 1/2
Del., Lack. and Western.....	33 1/2	34 1/2
Delaware & Hudson Canal.....	28 1/2	29 1/2
Adams Express.....	97	98
American Express.....	46 1/2	47 1/2
United States Express.....	47	48
Wells, Fargo & Co. Express.....	87	88
Erie.....	88	89
Harlem.....	137	138
Hannibal & St. Joseph.....	12 1/2	13 1/2
Illinois Central.....	32 1/2	33 1/2
Lake Shore.....	48 1/2	49 1/2
Michigan Central.....	40 1/2	41 1/2
Morris & Essex.....	51 1/2	52 1/2
Milwaukee & St. Paul.....	30 1/2	31 1/2
Mariposa.....	2	3
New York Central.....	90 1/2	91 1/2
New Jersey Southern.....	3 1/2	4 1/2
Ohio & Mississippi.....	3 1/2	4 1/2
Pacific Mail.....	30 1/2	31 1/2
Panama.....	34 1/2	35 1/2
Pittsburgh & Fort Wayne.....	13 1/2	14 1/2
Quicksilver.....	23 1/2	24 1/2
St. Louis Kansas City Northern.....	21 1/2	22 1/2
Toledo, Wabash & Western.....	1 1/2	1 3/4
Union Pacific.....	67	68
Western Union Telegraph.....	60 1/2	61 1/2

MINING STOCKS.

Mr. Ogden Haight, No. 16 New street, sends us the following report of the business of the New York Mining Stock Exchange for the week ending June 20th:

	Bid.	Offered.	Sales.
Alouez Mining Co.....	\$3.00	\$5.50	1,350
Atlantic.....	6.50	7.00	1,350
Calumet & Hecla Min. Co.....	169.00	171.00	40
Central.....	39.00	40.00	400
Franklin.....	10.00	10.00	100
Madison (ass't p'd.).....	25	30	60
Menard.....	1.00	1.00	100
Minnesota.....	20	20	500
National.....	18.00	21.00	100
Oscoda.....	40	40	300
Pewabic.....	35.00	37.00	100
Quincy.....	2.00	2.00	100
Ridge.....	1.00	1.00	100
Rockland.....	1.00	1.00	100

GOLD STOCKS.

Am. Flag G. M. Co., Col.....	10	10	1,400
Bohail.....	140	140	1,650
Lacrosse.....	29	31	12,000
N. Y. & Col.....	125	250	1.0
Season Consolidated.....	14.00	14.00	100
Alpha, Nev. Gold & Silver.....	7.00	8.00	100
Belcher.....	26.50	29.00	100
Best & Belcher.....	4.00	5.00	100
Caledonia.....	33.00	34.00	100
Consolidated Imperial.....	28.00	30.00	100
Consolidated Virginia.....	33.50	35.00	100
Crown Point.....	5.00	6.00	100
Eureka, G. V.....	3.00	3.00	100
Eschschuer.....	6.50	7.75	100
Gould & Curry.....	15.00	17.00	100
Hale & Norcross.....	6.00	8.00	100
Julia, Gold and Silver.....	3.00	3.00	100
Justice.....	9.25	10.00	100
Kentuck.....	8.40	9.00	100
Mexican.....	13.00	14.00	100
Overman.....	23.00	25.00	100
Ophir.....	24.00	26.00	100
Raymond & Ely.....	8.75	9.00	100
Savage.....	9.00	10.00	100
Sego, Belcher.....	27.00	28.00	100
Sierra Nevada.....	8.00	8.00	100
Silver Hill.....	3.00	3.00	100
Union Co.....	3.00	3.00	100
Yellow Jacket.....	10.00	10.00	100

LEAD STOCKS.

St. Joseph Lead Co.....	5.00	5.00	100
-------------------------	------	------	-----

SILVER STOCKS.

Silver Let Mining Co.....	25	25	100
---------------------------	----	----	-----

TUNNEL COMPANIES.

Bobtail Tunnel (ex. div.).....	2.50	3.50	100
--------------------------------	------	------	-----

MISCELLANEOUS STOCKS.

Smith & Parnace.....	10	10	100
Hunkil of Colorado.....	10	10	100
United Petroleum Farms.....	15	15	100

GENERAL HARDWARE.

The week under review has been a dull one in nearly every department of the Hardware business, and this state of things will, in all likelihood, continue until the opening of the fall season. In the matter of prices few changes have transpired—some goods are a little irregular, but as a rule prices are firm. The demand for American Hardware for foreign account is progressing very satisfactorily, and relieves the market in some measure from the dullness which is usual at this season.

We have received from Hammacher & Delius, Hamburg, Germany, a literal translation of the newly adopted Patent Law of the United German Empire, which will, no doubt, be of great interest to American manufacturers, as until the passage of this law American inventors had great difficulty in protecting their interests in that country. It will be noticed that one section of the law provides that if the applicant for a Patent does not reside in Germany, he has to have a representative. Hammacher & Delius offer their services to American inventors. They inform us that through their connections in Hamburg and Berlin, they are in a position to secure Patents with dispatch. The copy of the Patent Law will be found on pages 23 and 24.

The Jacobus & Nimick Manufacturing Co. have issued the following circular:

PITTSBURGH, June 15, 1877.
To the Hardware Trade: Our works were completely destroyed by fire on the morning of the 15th inst. Our patterns, which were in a fire proof vault, are uninjured, and we shall immediately resume operations in one of the foundries now vacant in this city.

We expect to be able to furnish our full line of goods within two weeks from this date, and are fortunate in having a considerable stock of goods in our warehouse, which was separate from our works.

We shall at once rebuild our factory on a more extensive scale, and intend to add to our line of goods, Padlocks, Tins and Drawer Locks, also a large variety of General Hardware, &c. We take this opportunity of thanking the trade for the patronage we have received in the past.

JACOBUS & NIMICK MFG. CO.
We are requested by the Peck, Stow & Wilcox Co. to state that the discount 60 per cent. off Gate Traps, which appeared in our prices current last week, was published without their authority. This we very cheerfully do, but the fact still remains that manufacturers of these goods have been cutting prices, and, as we said last week, Oneida Pattern Traps can be bought at the above named discount, and have in some cases been offered at even better figures. We have changed the discount on P. S. & W. Traps to 50 and 10 per cent., which they inform us is their regular price for these goods.

The condition of the Nail market is much the same as last week. The nominal price of 10d. is \$2.40, net, but this figure could be easily shaded for a good sized order. The demand is fair for the season.

Leng & Ogden, No. 212 Pearl street, have issued the following price list for some of their specialties:

Patent Weldless Cold Drawn Steel Boiler Tubes.			
Outside diameter.....	1	1 1/2	1 3/4
Wire gauge.....	18	18	16
Price per foot, gold.....	\$2.44	2.50	2.61
Outside diameter.....	2	2 1/2	3
Wire gauge.....	14	14	12
Price per foot, gold.....	\$2.50	1.04	1.25
Discount 35 per cent. on lots of 1000 feet or over.			

Landell & Leng's Patent Lever and Cam Valves—Best Steam Metal.

Size.....	1 1/2	1 3/4	2
Price, each.....	\$1.25	1.50	2.75
Size.....	2 1/2	3	3 1/2
Price, each.....	3.75	5.75	10.00

Landell's Patent Steam Siphons.

Size discharge.....	3/4	1	1 1/2	2
High Pressure.....	\$8.00	10.00	17.50	22.50
Low Pressure.....	10.00	13.50	20.00	25.00
Size discharge.....	2 1/2	3	4	6
High Pressure.....	35.00	45.00	65.00	150.00
Low Pressure.....	40.00	50.00	70.00	175.00

G. B. Walbridge & Co., No. 88 Reade street, have issued the following circular and price list for seasonable goods:

New York, June 15, 1877.

DEAR SIR: We have in stock, Clinton Wire Window Screen Cloth—both green and drab—of all widths, and offer it to you at 4 1/2 cents per square foot. Although it is early in the season, these goods are already scarce in the market, and we request your orders by return mail to insure execution. We also offer you:

Kitchen Ice Tongs, Japanned.....	per doz.	\$2.25
Rubber Hose, 1/2 in., 3 ply.....	per foot, 8 1/2 c.	net
Scandinavian, or Jail Padlocks.....		
No. 410, 6 Tumblers.....		\$3.75
No. 430, 9 ".....		6.75
No. 430, 9 ".....		Less 30 %

Also a full stock of Rothery's Files, Jennings' Bits, Tacks, &c. Yours, respectfully,
G. B. WALBRIDGE & CO.

Buell Lamberson, No. 97 Chambers street, has in press a price book for General Hardware, which is described in his advertisement on the 3d page. The book will be ready for delivery about July 5. It will have about 500 pages, and will be offered to the trade at \$10, bound with leather back and corners, and \$12 in genuine Russia leather binding. We hope to review it more fully when it comes from the printer's hands.

The Hardware Board of Trade, Limited, of which mention has already been made in these columns, have taken spacious offices, conveniently located, at Nos. 4 and 6 Warren street. We are informed that the subscription list of the company has been largely increased, a large proportion of our leading firms in Hardware and kindred trades having become members. In conversation with a prominent member to-day we were told that the efficient manner in which the company were carrying out the objects for which the Board was organized, exceeded the most sanguine expectations of its projectors—that the accuracy of the reports furnished by the company, the facilities offered for speedy collection of outstanding accounts, and its influence in cases of insolvency and bankruptcy, had already been tested to the entire satisfaction of the membership. Those in the trades interested, who have not yet familiarized themselves with this matter will find it worthy their consideration, as the information regarding credits, &c., which such an organization can collect, and which is free to all its members, is almost invaluable. The fullest particulars regarding the working of the Hardware Board of Trade, Limited, will be furnished on application to the secretary, at the above-named address.

BRITISH IRON MARKET.

(Specially reported by cable for The Iron Age.)

WEDNESDAY, June 20, 1877.

Scotch Pig.—The market is quiet, and quotations nominal and irregular.

Manufactured Iron.—There is but little demand, and prices are weaker.

Rails.—Without feature to note.

IRON.

American Pig.—Transactions during the week have been unusually light, even for these dull times, and the tone of the market is not as strong as it has been. Our quotations of first-class Irons are unchanged, and some makers positively decline business on any better basis than \$19 for No. 1. The only transactions outside of the usual small lots required for consumption that have come to our notice are 250 tons No. 1 on private terms, and 100 tons No. 1 (an outside brand) at \$17.50, cash. We repeat former quotations, viz.: Foundry, No. 1, \$18 @ \$19; Foundry, No. 2, \$17 @ \$18; Gray Forge, \$16 @ \$17.

Scotch Pig.—The market for Scotch Iron is a trifle easier, and our quotations show a slight concession from previous figures. Some small lots of Eglintou have changed hands during the week, and 100 tons Glengarnock was sold at \$25.50. We quote: Glengarnock, \$25.50 @ \$26; Eglintou, \$24.50, and Coltness, \$27.

Rails.—In the absence of any business we continue to quote Steel, \$45 @ \$47, at Mill, and Iron, \$23 @ \$26.

Old Rails.—We quote as before, \$19. Scrap.—Wrought from yard is held at \$23 @ \$24 for No. 1. No sales are reported during the week.

METALS.

panies the prospect is not more favorable than for the dealer. Prices are hardly worth quoting, as before our next issue another change may take place. The larger sizes of Lehigh are pretty firm at \$2.85 per ton—the circular price. Lehigh Stove is not so strong, and we hear of concessions being made from the regular price of \$2.75. Chestnut is weak at \$2.60. Lackawanna, Lump and Steamer are quoted at \$2.50, and other sizes at \$2.60. It is a common remark that these prices must be "bottom," but if the quantity of Coal sent to tide-water does not diminish, so as to somewhat approach the consumption, even lower prices than these may be expected. It appears from the reports made of what Mr. Gowen has done in Europe that the Philadelphia and Reading are to find their interest account for the next three years, and hence will at once become one of the strongest competitors for the Anthracite trade. They are reported to be shipping a very large amount of Coal, and using every possible means to find new and profitable markets, intending to get a profit out of a large tonnage at low prices. Taking all things into consideration, the market is in about the best possible condition for the consumer.

OLD METALS, PAPER STOCK, &c.

Nothing definite has transpired in the condition of the market for Old Metals, Paper Stock and other Junk materials during the period that has elapsed since the date of our last. Copper, Brass, Composition and Lead are without demand, and prices remain nominally unchanged. Wrought Iron is in better request, but not sufficiently so to alter quotations. Rags and Paper Stock still continue unchanged from the dullness previously reported. We quote the following as the current purchasing rates:

Old Metals.—Copper, 14c. @ 15c. per lb.; Yellow Metal, 10c.; Brass, 8c.; Composition, heavy, 12c.; Lead, solid, 4c.; Tea Lead, 4c.; Zinc, 3c.; Pewter, No. 1, 13c.; No. 2, 12c.; Spelter, 5c.; Wrought Iron, \$18 per ton; Light do., \$10 per ton; Stove Plate, \$9 per ton; Machinery, do., \$12 per ton; Burnt Iron, \$4 per ton.

Rags, &c.—Canvas, Linen, 4c. @ 5c.; do. Cotton, No. 1, 5c.; No. 2, 4c.; White, No. 1, 4c.; No. 2, 3c.; Colored, do., 2c.; Mixed, Woolen, 2c. @ 3c.; Soft, do., 5c. @ 6c.; Gunny Bagging, 1c.; Jute Butta, 1c. @ 2c.; Kentucky Bagging, 3c.; Book Stock, 2c.; Newspaper Stock, 2c.; Waste Paper and Scraps, 1c.; Kentucky Bale Rope, 4c.; Oakum Junk, No. 1, 4c. @ 5c.; do. No. 2, 3c.; Tanned Shaking, 1c. @ 1c.; Grass Rope, 3c. @ 3c.

PHILADELPHIA.

Office of The Iron Age, 220 South Fourth St., Philadelphia, June 19, 1877.

Business is still in a very depressed condition, although in some departments there are slight indications of improvement. A good many inquiries are being made for machine tools and articles of that class, from which it may be inferred that the manufacturing interests are beginning to revive. After making careful inquiries at the leading establishments, we find that in some quarters there is quite an improvement, while in others the report is just the reverse; on the whole, however, the tendency is toward greater activity, and if a small proportion of the inquiries now being made results in actual business, we shall no doubt soon have better times. Quite a new departure is being made by one of our machine tool firms, who will offer about \$30,000 worth of their manufactures at auction on the 22d. The result cannot safely be predicted. The comments of the trade are not favorable. The offer to duplicate any article "at the same prices they fetch at the sales" would seem to indicate prices are limited to at least actual cost, and as other firms say they also are willing to sell at cost, simply to keep business together and reduce their stock, there can be no special object in buying at auction, in the event of prices being limited. It is not worth while, however, to speculate upon a matter which will so soon be put to a practical test. There is also a growing feeling that our shipyards will soon be receiving fresh orders. Many of the most important contracts are being rapidly run off, but the renewed inquiry for Ship Plates, &c., denotes a probability of further orders in the immediate future. The events in Europe, in a business point of view, are regarded as of vast importance to this country; and if England should be drawn into the conflict, the demand for American vessels will be enormous. The shipping facilities of England, large as they are, will be required for government purposes, and the ordinary carrying trade will naturally seek a neutral flag. In such a contingency, which is becoming quite probable, our shipping interests will receive such a stimulus as will again give United States vessels advantages beyond those of all competitors, and serve to re-establish their former supremacy. Fears are expressed by some parties that foreign built vessels may be admitted to American registry, but such a suicidal policy is too improbable to be worthy of serious consideration. The keynote of a general business revival may possibly be heard first on the Delaware, and from thence to every State in the Union. No great improvement can reasonably be expected during the hot summer months, but the clouds of depression are beginning to brighten, and better times are not far distant.

Pig Iron.—The condition of the market has not improved since our last, and when sellers are very anxious to realize, concessions have to be made in order to secure buyers. Prices are nominally unchanged, but there is no doubt that buyers have had the advantage for some days past, and the general market is at least 5c. per ton lower since last week, and more in special cases. This is quite natural, bearing in mind the fact that the majority of the mills regard the first of July as settling day, and no one can be induced to buy in excess of their immediate requirements. After the first of

the month it is expected that a better demand will set in, as stocks will be run down to the lowest point possible, and with the prospect of a better business generally, buyers will no doubt take hold more freely. In the meantime, we quote the market dull and heavy at \$16.75 to \$17 for Gray Forge; \$17.50 to \$18 for No. 2, and \$18.75 to \$19 for No. 1, four months, without interest, or 50c. per ton reduction for prompt cash. Special brands bring a full dollar more money than above quoted.

Manufactured Iron.—Taking the market all through there seems to be a slight improvement, although the demand is irregular and spasmodic. The large contracts referred to in our last, with others pending, have given a slight impulse to the trade, and in some directions it may be said things are a little better. In others there is no improvement, and but little prospect of it in the immediate future. Reports from the interior, however, show a fair degree of activity in the class of trade which is most depressed on the seaboard. For instance, nearly all the Plate mills are busy on work for the shipbuilders; so also are the mills which make bridge iron a specialty. The Sheet Mills are moderately employed, while the Bar Mills are about as dull as ever. The explanation would seem to be that, where specialties are required for local work, mills in the immediate vicinity get the orders, but where such an article as Merchant Bar Iron is required, and can be had from store, it is shipped from the interior in such quantities as to completely crowd out the local mills. The low rate of freight to the seaboard gives another advantage, as special rates can always be had to any of the large seaboard cities, while local rates have to be paid if our mills undertake to distribute their products. The country mills have, therefore, the advantage of being able to secure their own local trade at remunerative prices, and also move their surplus at low freights, and compete with Eastern mills. We are also informed that in addition to the fact of many mills selling their surplus to Eastern parties at low prices for cash, others consign it for sale, getting cash advances against their shipments. In this way the seaboard cities are loaded down with Bars, which have got to be sold at some price, regardless of cost.

Bars.—There is a better demand, and we are glad to learn that some of the leading city mills have within the past day or two received some important orders. Prospects are better than for weeks past, and unless the bottom drops out again, it seems as though there will be a fair summer's trade. The demand is more for first-class brands than we have noted for some time past, and it seems as though buyers were discriminating closely as to quality. We quote Common, 1.50c. to 1.75c.; Best Refined, 2c. to 2.01c.

Plate and Tank Iron.—The demand is very fair, and, with one or two exceptions, the mills are actively employed. Some considerable sales have been made within the past few days, and prospects for continued business are quite encouraging. Prices are a little easier, however, and quotations would no doubt be shaded for round lots. We quote Ship Plates, 2.37c. to 2.50c.; Tank Iron, 2c. to 2c. 1/2; Shell Iron, 3c.; Flange Iron, 4c. to 4c. 1/2; and Best Bloom, 6c. to 6c. 1/2.

Sheet Iron.—There is no change of importance; demand fair, but prices rather weak, and for round lots. Some concessions would be made from regular, which are as follows: Common American, No. 6 to 17, 2c. to 3c.; No. 18 to 23, 3c. to 3c. 1/2; Best Charcoal Bloom, No. 6 to 20, 5c.; No. 22 to 28, 5c. to 6c.; Philadelphia Russia, 8c.

Skip Iron.—Some important sales have been made within the past few days, but the exact quotations have not been made public. They are said to be very low, however, and no doubt less than the general quotations, which are, nominally, 2.15c. to 2.50c.

Steel Rails.—Business is rather quiet, although sales of small lots are being made almost daily. Prices are steady and unchanged at \$46 to \$48, cash, at mills, with sales at medium figures. The mills have still a fair amount of orders on hand, and with fair prospects of a steady demand during the summer, prices as above are well maintained.

Iron Rails.—There appears to be quite an active demand, and we believe sales amounting to 3000 or 4000 tons will be closed within a day or two. The details, however, are of a private nature, but reduced to a cash basis our quotations fairly represent the transactions—say, \$33 to \$36, cash, at mills.

Spikes.—The demand is quite active, and some considerable sales are reported. We quote: Railway Spikes, \$2.10 to \$2.30; and Mining Spikes, 4 to 4 1/2 by 3/4, 2c. 1/2; 4 to 4 1/2 by 7-16, 3c.; 3 1/2 by 3/4, 3c.

Old Rails.—The market is very dull, and no sales of importance have been effected. We quote, \$19.50 to \$21, as to quality and terms.

Scrap Iron.—The market is dull at \$15 to \$16.50 for Cast, and \$22.50 to \$24.50 for Wrought.

Old Car Wheels.—One sale reported at \$19, with more offered at same price.

Nails.—The market is steady; \$2.50 is the usual price, although in special cases some concessions have been made.

Tin Plates.—The demand is steady and prices without change. I. C., 10x14, Best Charcoal Bright, \$7.50 to \$8; I. X., 10x14, \$9.75 to \$10.25; Best Charcoal Leaded, 28x30, \$14 to \$14.50; good Charcoal Leaded, \$13.50 to \$13.75; other good brands, \$12.50 to \$13.25; good Bright Tin for Cans, &c., \$6.50 to \$7.25; Coke Leaded, 14x20, \$6 to \$6.50.

Lead.—There is no change to report. The demand is very light, and prices weak. Some lots of Domestic amounting to 150 tons have been sold at about 5c. currency. Foreign Pig is nominal at 6c. to 6c. 1/2, gold. Manufactured is steady at late quotations, viz: Pipe,

9c.; Sheet, 9 1/2c., and Bar, 7 1/2c., less the trade discount of 10 per cent.

Shot.—Drop Shot, 25 lb. bags, 9 1/2c.; do., 5 lb. bags, 10 1/2c.; Buckshot, 25 lb. bags, 10 1/2c.; do., 5 lb. bags, 11 1/2c.; Conical Balls, 25 lb. bags, 10c. per lb., net; Bar Lead, 5 oz., 1/2 lb. and 1 lb. Bars, 7 1/2c., less 10 per cent. to the trade.

PITTSBURGH.

Office of The Iron Age, 77 Fourth Avenue, Pittsburgh, June 19, 1877.

Pig Iron.—Business continues exceedingly dull, with no prospect of any change for the better for some time to come. Old Rails are much cheaper than Pig Iron, as they require no puddling, and, in addition, the mills generally have a good supply of Muck Bar, and but few orders for finished goods. Probably more than three-fourths of the puddling furnaces are idle at the present time, and it is not likely that they will be started up for a month, perhaps six weeks. Prices nominally unchanged. Best Mill Irons, \$21 to \$21.50, 4 months; sale of 300 tons at \$20.50, cash; No. 1 Foundry, \$23 to \$24, 4 months; No. 2, \$23 to \$22.50. Cornwall Red-short has been reduced from \$19 to \$18 at furnace, equal to \$21.50 delivered here, instead of \$22.50.

Manufactured Iron.—Continues exceedingly dull, and there is no prospect at present of any improvement before the middle of next month, if then. So far as your correspondent can learn, none of the mills are working double turn, and the indications are that there will be a general suspension within the next few weeks. As an addition to unremunerative prices, orders are very light, and then it is customary to stop and take stock in July. A meeting of the Western Association was to have taken place here last week, but in consequence of a very thin attendance, no business was transacted. Prices quoted nominally at 1.55c. to 1.75c.

Nails.—The Nail trade is also in bad shape, as there is no uniformity in prices. At the meeting of the Western Nail Association in this city last week, it was agreed to allow the members thereof to meet competition, which gives each firm, for the time being, the right to make their own prices. Some dealers have sent out a \$2.35 list, 60 days, and this, being the case, it is probable sales are making in first hands as low as \$2.25, 60 days, at which rates there is no margin for profit.

Horse and Mule Shoes.—Very dull, and not likely to be any improvement until the latter part of August, perhaps September. Prices nominally unchanged; one hundred keg lots, \$3.80 and \$4.80.

Steel.—Manufacturers continue to report business falling, although not any more than usual at this season of the year. Prices for leading styles continue weak but unchanged. The meeting of axle and spring manufacturers, which took place in this city two weeks ago, agreed upon a new price, but it is not to be adopted until those firms not represented at the meeting agree to stand by it. There are some thirty firms engaged in the business, of which only about one-third were represented at the conference to which reference has been made.

Wrought Pipe.—There is a fair and increasing business, although it is not as brisk as it should be at this season of the year. No change in prices. The project of shutting down for sixty or ninety days is still being agitated, and may yet succeed, and there is no question but the movement would be a good one, as overproduction is the great source of trouble at the present time.

Window Glass.—The demand continues light, and no improvement is looked for until the fall trade opens up. There was a meeting of manufacturers in this city last week, but no change was made in prices; discount by the carload, 70 per cent.; smaller lots, 60 and 10 to 60 and 20.

White Lead.—The meeting of the Western Association took place in this city last week, but there was nothing of importance done, nor no change made in prices. Trade was generally reported dull, but increased business this fall is expected.

Bolts and Rivets.—There was also a meeting of Bolt and Rivet manufacturers in this city last week, but there was nothing done of any interest to the general public; no change made in prices.

Will Rebuild.—The works of the Jacobus & Nimick Manufacturing Company, which were destroyed by fire last week, will be rebuilt, but whether on the old site or not has not yet been decided.

BOSTON.

JUNE 16.—Pig is very dull, and further concessions would have to be made to effect any sales of magnitude. We quote \$22.50 to \$23.50 for No. 1; \$21.50 to \$22 for No. 2, and \$21 to \$22 for Gray Forge. Bar is dull, quoting \$46 to \$47 for Refined, and \$37 to \$38 for Common. Nails are in light demand at unchanged prices. Sheet is selling at 3c. to 3c. 1/2 per pound. Russia is quiet at 12c. currency. We quote English Spring Steel, 7c. to 8c., gold; 9c. to 11c. for German; 9c. to 11c. for Machinery; 14c. to 15c. for Cast; 10c. to 12c. for Billet; 8c. for American Spring; 13c. to 14c. for Cast; 9c. for Billet; and 8c. for Machinery. Copper has done a little better, with sales of 300,000 to 400,000 lbs. Lake at 19c. to 19 1/2c. July deliveries are said to have sold at 19c., but late in the week they were offering at 19c. For Manufactured we quote: New Sheathing, 30c. to 31c.; Bolts and Brackets, 31c. to 31 1/2c.; Yellow Metal Bolts, 35c. to 35 1/2c.; ditto Sheathing, 30c. to 30 1/2c. Lead is easy, at a further decline. We quote: Pig, 5c. to 5c. 1/2, currency, for Domestic; Sheet, 9c.; Pipe, 9c.; Tin Lined Pipe, 16c.; Bar Lead, 8c. to 9c., less usual trade or 10 per cent. discount. Antimony is firm at 12c. to 12 1/2c., gold, for Boston spot lots, and Spelter is easy, closing at \$6.25 on the spot for 10 ton lots. Tin is flat, with free sales of about 100 tons to arrive. We quote: Strains, 16c. to 16 1/2c.; Banca, 19c. to 19 1/2c.; Refined English, 16c. to 16 1/2c., gold. We quote Plates: Charcoal I. C., \$7 to \$7.50; Coke, \$6.10 to \$6.25; and Terne at \$6.75 to \$7.25, gold.—Commercial Bulletin.

ST. LOUIS.

Special report by Messrs. SPOONER & COLLIER, Iron commission merchants, 217 North Third Street, St. Louis, under date of June 14: Our market is still dull. A reduction in Missouri Irons has been made the past week, and we change our quotations accordingly. Our standard brands are held firm at quotations, and no disposition is manifested to make lower prices. The fact that Pig Iron has at last found rock bottom is conceded by everyone.

	No. 1.	No. 2.	Mill.	White and Mott'd
Missouri Stone Coal.....	\$23.00	\$22.00	\$21.50	\$20.00
Missouri Charcoal.....	23.00	22.00	23.00	30.00
Tennessee Charcoal.....	23.00	22.00	23.00	30.00
Southern Coke, very soft and strong.....	25.00	23.00	23.00	22.00
Hanging Rock Charcoal.....	26.00	24.50	23.50	.....
H. R. Charcoal, Cold-short.....	25.00	24.00	.....	.....
Extra.....	No. 1.	No. 1.	No. 1.	No. 2.
Alice H. R. Coke.....	25.00	23.00	24.50	23.00
Quincy, West Virginia, Coke.....	25.00	24.00	23.50	22.50

COLD-BLAST CHARCOAL—All Numbers.				
Hanging Rock.....	\$23.00	@ 40.00—4 mos.		
Tennessee.....	23.00	@ 30.00—4 mos.		
Kentucky.....	23.00	@ 30.00—4 mos.		
Missouri.....	23.00	@ 30.00—4 mos.		
Georgia.....	23.00	@ 30.00—4 mos.		
Alabama.....	23.00	@ 30.00—4 mos.		
Assorted Bar Iron.....	.....	@ 2.10 rates.		
No. 1 Wrought Scrap.....	.....	@ 1.00		
No. 1 Railroad.....	.....	@ 1.00		
Machinery Cast.....	.....	@ 1.00		
Light Cast.....	.....	@ 1.00		
Old Car Wheels.....	19.00	@ 20.00—4 mos.		
	18.00	@ 19.00—4 mos.		

BALTIMORE.

Messrs. WYETH & BROTHER, Iron and Steel merchants, 46 and 48 South Charles street, report us the following prices, under date of June 18: The business situation presents no special features of change, the market continuing dull and stagnant. No general improvement can be looked for until the opening of the fall season.

AMERICAN REFINED BAR IRON.
1 to 5 wide by 3/4 to 1 thick..... 1.95 to 2c. @
1 to 4 1/2 wide by 1 1/2 to 3 thick..... 1.95 to 2c. @
Round and square, ordinary sizes, from 1/2 to 3 inclusive..... 1.95 to 2c. @
Drop iron, 1 1/2 wide and upward..... 3 to 3 1/2 @
Band iron, from 1 1/2 to 4 in. wide..... 3 1/2 to 3c. @
Horse Shoe Iron 3/4 to 1 wide by 3/4 to 1 thick..... 3 1/2 to 3c. @
Horse Shoe Iron 1 1/2 to 2 wide by 3/4 to 1 thick..... 3 1/2 to 3c. @
Black Diamond Cast Steel, Plates, Squares and Octagons, ordinary sizes..... 14c. to 15c. @
Machinery Steel..... 8 to 9c. @
Cast Spring Steel..... 7 1/2 to 8c. @
Homogeneous Steel Plate..... 5 1/2 to 6c. @
Perkins' Horse Shoes, per keg of 100 lbs..... \$3.92 1/2
Mule Shoes..... 4.92 1/2
R. R. Spikes..... 3 1/2 to 3c. @
Common Horse Nails, from 14c. to 15c. per pound.

Putnam Horse Nails..... 23 24 25 26 28c. per lb.
Globe Horse Nails..... 23 24 25 26 28c. per lb.
Messrs. R. C. HOFFMAN & Co., Iron and commission merchants, No. 23 South Frederick street, report the Pig Iron market as follows, under date of June 18: Our Iron market is without change. Business dull. We quote:
Baltimore Charcoal..... \$23.00 @ 31.00
No. 1..... 23.00 @ 32.00
Anthracite No. 1..... 20.00 @ 21.00
No. 2..... 19.00 @ 20.00
No. 3..... 18.00 @ 19.00
White and Mottled..... 15.00 @ 16.00

RICHMOND.

Mr. ASA RYNDER, Iron merchant and furnace Agent, Richmond, Va., writes as follows under date of June 18: The market continues depressed, with no change in quotations:
Va. Cold-blast Charcoal, Cold-short..... \$21.00 @ 25.00
Va. Cold-blast Charcoal Neutral..... 30.00 @ 32.00
Anthracite, No. 1..... 21.00 @ 22.00
No. 2..... 20.00 @ 21.00
No. 3..... 19.00 @ 20.00
Coke, No. 1 (Quinnimont)..... 23.00 @
No. 2 X..... 22.00 @

LOUISVILLE.

Messrs. GEO. H. HULL & Co., under date of June 18, write us as follows: A heavy feeling still pervades the market, but there is more inquiry for Foundry Irons. No quotable change in prices. The usual time, 4 months, is allowed on the quotations below:

FOUNDRY IRONS.				
No. 1 Hanging Rock, Charcoal.....	\$24.00	@ 24.50		
No. 2.....	21.00	@ 22.00		
No. 1 Southern, Charcoal.....	21.00	@ 22.00		
No. 1 Hanging Rock, Stonecoal and Coke.....	22.00	@ 23.00		
No. 2 Hanging Rock, Stonecoal and Coke.....	20.00	@ 21.00		
No. 1 Southern, Stonecoal and Coke.....	20.00	@ 21.00		
No. 2.....	20.00	@ 21.00		
"American Scotch".....	22.50	@ 23.00		
Silver Gray.....	19.00	@ 21.00		

MILL IRONS.				
No. 1 Charcoal, Cold-short and Neutral.....	30.00	@ 30.50		
No. 2.....	19.00	@ 20.00		
No. 3 Stonecoal and Coke, Cold short and Neutral.....	18.50	@ 19.00		
No. 1 Hanging Rock, Cold-short and Neutral.....	22.00	@ 23.00		
White and Mottled, Cold-short and Neutral.....	16.00	@ 17.00		

CAR WHEEL AND MALLEABLE IRONS.				
Hanging Rock, Cold-blast.....	35.00	@ 38.00		
Alabama and Georgia, Cold-blast.....	36.00	@ 38.00		
Kentucky, Cold-blast.....	35.00	@ 36.00		

CINCINNATI.

Messrs. L. R. HULL & Co., under date of June 16, write us as follows: Pig Iron.—The market is only fairly active, and does not show any decided improvement since our last report. Prices range the same, without indications at present of any advance:

NOT-BLAST FOUNDRY.				
Hanging Rock No. 1, Charcoal.....	\$24.00	@ 24.50—4 mos.		
Hanging Rock No. 2, Charcoal.....	21.00	@ 22.00—4 mos.		
"No. 1, Coke.....	24.00	@ 24.50—4 mos.		
"No. 2, ".....	22.00	@ 22.50—4 mos.		
"No. 1, Stonecoal.....	21.00	@ 22.00—4 mos.		
Virginia No. 1, Coke.....	24.00	@ 24.50—4 mos.		
"No. 2, ".....	22.00	@ 23.00—4 mos.		
Ala. and Tenn. No. 1, Charcoal.....	23.00	@ 24.00—4 mos.		
"No. 2, ".....	21.00	@ 22.00—4 mos.		
Fannie U. S. Scotch, No. 1.....	24.50	@ 25.00—4 mos.		
Alice.....	21.00	@ 22.00—4 mos.		
Am. Scotch, No. 1.....	21.00	@ 22.00—4 mos.		

FORGE IRONS.				
Hanging Rock No. 1, Charcoal.....	\$21.00	@ 21.50—4 mos.		
Hanging Rock No. 2, Coke.....	21.00	@ 21.50—4 mos.		
Virginia, No. 1.....	20.00	@ 21.00—4 mos.		
Ala. and Tenn. No. 1, Charcoal.....	30.00	@ 21.50—4 mos.		
Red-short, No. 1, Coke.....	22.50	@ 23.00—4 mos.		
Cold-short, No. 1, Stonecoal.....	19.00	@ 20.00—4 mos.		

CAR WHEEL AND MALLEABLE.				
Hanging Rock.....	\$40.00	@ 40.00—4 mos.		
Southern and Western Brands.....	30.00	@ 35.00—4 mos.		
ORE.				
Lake Superior.....	\$3.50	@ —cash.		
Virginia Hematite (Washed).....	4.25	@ —cash.		

CHATTANOOGA.

Special report by S. B. LOWE, dealer in Metals, under date of June 18: The market for Pig Iron the last week has been active, with

sales of 500 tons No. 1 Foundry and White and Mottled Good inquiry, but can quote no change in prices:

COKE.				
No. 1 Foundry, extra.....	\$21.00	@ 21.50		
No. 1 Foundry.....	19.50	@ 20.00		
No. 2 Foundry.....	17.50	@ 18.00		
Gray Forge.....	16.00	@ 16.50		
White and Mottled.....	15.00	@ 15.50		

COLD-BLAST CHARCOAL.			
Car Wheel Metal.....	\$29.50 @	27.50	
..... extra standard.....	24.50 @	34.50	
Forge Metal.....	17.50 @	20.50	
Muck Bar.....	30.50 @	34.50	
Old Car Wheels.....	17.00 @	-	
Old Rails.....	16.90 @	17.00	
Brown Hematite Ore, 50 to 56 per cent. per ton.....	\$1.75 @	2.25	
Red Possilliferous Ore, 53 to 56 per cent. per ton.....	1.50 @	1.75	

to the wants and enjoyments little in keeping with the labor they are able to perform. In every day dealings the market has taken the place of the old proverbial German apathy. All these drawbacks and defects combined have rendered us incapable of advantageously competing with foreign nations at home and abroad. At home we are, indeed, helplessly handed over to a ruinous foreign competition. We now discover, when it is too late, that our artisans and operatives have lost their former skill, and it is not an easy matter to recover our former place in the world's markets. Socialism has also had its share in adding to the confusion and demoralization. The business aspect is discouraging, and a great crisis of some kind seems unavoidable.

HOLLAND.

(Koch & Vitterboom.)

ROTTERDAM, June 5, 1877.—*Tin*.—Since the Netherlands Trading Society's Barco sale came off on the 30th ult. our market has relapsed into quietude, and but a few transactions have transpired. Of Barco tin some sales were made at 48½ guilders the 50 kilos, to be delivered from the sale, and of Billiton on the spot, at 41½.

EXPORT OF TIN FROM HOLLAND.

To	March, 1877.	1876.	1875.
Tons.	Tons.	Tons.	Tons.
Germany.....	323	347	386
England.....	53	81	81
Belgium.....	138	89	176
France.....	53	19	43
Hamburg.....	36	27	34
United States.....	19	5	21
Other countries.....	16	5	21
Total.....	539	576	730

CHINA.

(Arnhold, Karberg & Co.)

CANTON, May 4, 1877.—*Metals*.—Lead.—Settlements show a rather weaker market. L. B. having been quiet at \$7.47½ to \$7.45 per picul. In distant shipments some business has been done at \$7.30 per picul. German Lead is well maintained in value, owing to its comparative scarcity. We quote \$7.35 to \$7.50 per picul. Sales of the week, \$150,000. A fair amount of business has been done at a decline of 50c. per picul, but at the close the tone of the market is rather firmer. We quote the metal \$18 to \$17½ per picul. Sales of the week, \$150,000. *Quicksilver*.—Stocks are excessive and there is no disposition to operate beyond the most urgent requirements, although sellers are quite willing to meet buyers in point of prices. We quote Spanish, \$66 to \$61 30 per picul, and California, \$61 to \$61 30. Sales, 1850 flasks.

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From our Regular Correspondent.)

SHEFFIELD, Eng., June 4, 1877.

THE TRADE OUTLOOK

has not improved in any appreciable degree since my last communication was penned, nor are there any present indications of an alteration for the better in the immediate future. There are some few symptoms here and there which afford grounds for entertaining that hope which is popularly supposed to "spring eternal in the human breast," but for the most part trade matters are so stale and flat that any inferences drawn from them, generally must needs be bare hypotheses. All that we know, we know; that which will be, we don't know, and it is probably very well that we don't. We are bound to bear the "ills we have," and when those we now "know not of," shall come uppermost on the wheel, why then we grin and abide—and so on *ad caput*. In brief, what with the Russo-Turkish skirmish, the unsettled state of Austria, the political crisis in France, the excitement in Greece, and the unprofitableness of the Eastern markets, prospects are not bright, and under such gloomy conditions cannot appear brilliant. Some of the Colonial, South American, Indian, etc., markets are, perhaps, a little better, and their indents compensate somewhat for the deprivations I have just detailed, but, on the whole, the balance is decidedly against us, and the chances are that we shall, perforce, remain in this unsatisfactory condition for another twelve months—or, it may be, for a couple of years. Up to the time of writing

OUR WAR NEWS

is very meagre, and we are told that operations on a large scale in Europe will not be inaugurated by the Czar until toward the close of this month. The Turks appear to be having altogether the best of the fighting in Asia Minor, but in Europe they are content to remain on the defensive. A private letter from Rastchuk tells me this morning that all along the southern bank of the Danube the Ottoman forces are ably disposed, and are so well armed that the Russians will have a desperate task before them whenever they cross the river to begin the attack in earnest. There are peace rumors afloat, but it does not appear that they have any reliable foundation. It is not by any means likely that Russia would assemble a great force, and then allow peace negotiations to go on without striking a blow. I should suppose that the real cause of the delay is the abnormal flooding of the Danube and its marshy vicinity. When the river becomes passable then, I fancy, the Muscovite blow will be struck,—sharp and stinging.

THE RUSSIAN PLOW ORDER

again forms the subject of a controversial article in the *Ironmonger* for June. You will, perhaps, quote the whole in another column, but I may, nevertheless, give the gist of the *Ironmonger's* statements here. It is alleged that Messrs. Avery & Sons, of Louisville, have taken unfair advantage of what was in no sense a competitive trial, inasmuch as only the American plows were at the place—near Odessa. The *Ironmonger* then proceeds to quote the *New Russian Telegraph*, the St. Petersburg *Agricultural Gazette*, the *Odessa Telegraph*, &c., in support of its statements, which are certainly worthy of close attention at the hands of the Louisville firm, particularly if they allege that the American plows are totally unsuited to the soil of Southern Russia.

THE MINERS' NATIONAL CONFERENCE, at Durham, last week, carried on its deliberations in much the usual manner, the great Alexander being to the fore as a matter of course. The most wonderful resolution submitted was that sent by the West Yorkshire miners, who suggested that the whole community of miners in the kingdom should be laid idle for a month or six weeks, in order to restrict the output and

stop the ruinous competition in the coal trade, and the downward tendency of wages! When this proposition was put the president of the Northumberland miners said he could not conceive how such a proposal could come from "men who had hair on their heads, and beards on their faces. If it had emanated from some island where they ran about with naked backs he could have understood it." This rough but caudal criticism appears to have influenced the meeting, which ultimately carried a resolution of such general importance that I shall quote it in *extenso*; thus:

1. That this conference views with the most serious apprehension the continual fall in the rate of the miners' wages, and believing such can be stayed by a proper organization of labor throughout the kingdom, it, therefore, agrees to empower the board to summon, if required, a conference from all mining districts of the United Kingdom, especially to consider the best mode of stopping such reductions, either by partial suspension of labor, or by the restriction of the daily output for a time, or in any other way that seems best calculated to produce beneficial results.

2. That, as this question also deeply affects the workers in the mines in France, Belgium and Germany they would ask them to consider, with the miners of the United Kingdom, the subject, and that they be requested to communicate with the officials of the Miners' National Union on the matter, and also by representatives appointed from among themselves to confer with us on the subject at the conference, when called.

I am given to understand that your miners will also be asked to take part in this conference.

MR. MACDONALD, M. P.,

In the course of his presidential address, said that it was impossible for America to injure our iron trade. If it was "true," said he, "that they (the Americans) had damaged Sheffield goods in the American market, it was because the Sheffield manufacturers had not kept pace with Yankee ingenuity, but had adhered too rigidly to old orthodox notions. It was the same with Belgium."

AS TO FOREIGN COMPETITION.

The conference passed the following comprehensive resolution: "That the question of foreign competition demands the attention of the miners of the United Kingdom, in as far as it may affect their wages and their social comfort. 2. That competition between the various districts of the United Kingdom itself also seriously affects the condition of the mining population. 3. That it has become necessary for us to consider how far a wise system of emigration and migration may be of benefit to the miners of Great Britain. It is therefore agreed that the president, secretary, and treasurer, and Mr. Burt, M. P., of the Miners' National Union, form a committee to obtain—(a) all the information they can on the subject of foreign and local competition; (b) that they be empowered to purchase documents that will give them correct knowledge on the subject, and, if need be, visit the competing countries or districts, and obtain reliable information. 4. That they also collect all reliable information on the subject of emigration and migration, which, along with the results of their inquiries on the subject of competition, they shall publish from time to time for the instruction of the members of the National Union and the public generally."

SCOTCH PIG IRON

has remained rather quiet during the week, although the shipments have been fairly well maintained. There are now 137,394 tons in Connal's stores, an increase of 1288 tons in the past seven days. Freight is unchanged.

Writing on June 1, from Glasgow, James Watson & Co. said: "The warrant market has been very quiet this week with little variation in price. The opening figure on Monday was 54½ per ton, and same day 53½ per ton was accepted; on Tuesday and Wednesday it remained steady from 53½ to 54½; yesterday the tone was firmer at 54½ per ton, while to-day it has been quieter from 54½ to 54; closing buyers at the latter figure. Makers' quotations are generally lower. Shipments last week were 10,556 tons, against 10,696 tons in the corresponding week of 1876. We quote:

G. M. B. at Glasgow	No. 1.	No. 2.
Gartshore,	55 1/2	52 1/2
Coltness,	56 1/2	53 1/2
Summerlee,	56 1/2	54 1/2
Langloan,	56 1/2	54 1/2
Carbarn,	56 1/2	53 1/2
Calder, at Port Dundas	56 1/2	53 1/2
Glenarnock, at Ardrossan	56 1/2	54 1/2
Edginton,	55 1/2	52 1/2
Dalmellington,	56 1/2	54 1/2
Shotts, at Leith	56 1/2	53 1/2
Kinnell at Bo'ness	56 1/2	52 1/2

The prices current of John E. Swan & Bros., Limited, same date, include Coltness No. 1, 67; Glenarnock No. 1, 59/8, and Edginton No. 1, 55/8.

The quotations of Messrs. William Colvin & Co. approximate to the foregoing.

THE SHIPWRIGHT'S STRIKE

on the Clyde is necessarily proving a serious matter, and is likely to prove still more weighty now that the government needs its contracts executed in a more speedy manner than usual. All efforts to reconcile the contending parties have so far failed, nor do I suppose the men will be inclined to give in until their accumulated fund of £45,000 is nearly or quite exhausted.

THE OTHER LABOR DISPUTES

are in much the same condition as last week. In the Northumberland colliery districts the men remain out, which is also the case in Fife and Clackmannan, and in portions of the Lancashire coal field. It appears clear, however, that the men will be beaten, for at this season, if at any time of the year, the coal owners can afford to protract the struggle. The nail, bolt and nut and other union disputes are also unsettled. The Cradley Heath chain makers have given notice to their employers for a revision of prices after June 23.

TRADES OF SHEFFIELD.

The more general resumption of work this week is thus far on a somewhat steadier scale, a result doubtless attributable to the accumulation of orders at the smaller establishments during the Whitnitside vacation. In no single instance, however, do I hear of any activity, nor does anyone appear to believe in the possibility of any great improvement until the Eastern war has assumed aspects which have yet to be developed. It is, of course, possible that the strikes in other districts may do some good to this, or, at all events, lead to some speculation. On the other hand, the strike of the Clyde shipwrights is a check in the opposite direction, inasmuch as the chief local manufacturers have long done an exceedingly good business with the Clyde shipbuilders in steel and iron plates, propeller castings, and the like.

In connection with the iron trade proper of the town and district, there is hardly a single new feature worthy of being specially mentioned. The leading Sheffield establishments are only moderately well engaged in the iron departments, the chief production being boiler and ship plates and armor. The armor plate mills, however, are by no means so busy as might be surmised in the present disturbed state of affairs, although there is a steady output both of plates for vessels and turrets, and armor for land forts.

At the merchant iron works hereabout the situation is extremely bad, and verges pretty closely upon the borders of being a total stoppage. The Parkgate Company, as seen by the report quoted by me last week, have lost £3000 odd on the year's working, and it is no secret that another local concern of the same kind will scarcely show to better advantage. Some of the private firms are no better off, but in these cases their exact position does not transpire so publicly. At some of the foundries just outside the town there is a tolerable amount of work in course of execution, much of it being pipes, mains, and other large castings for gas and water works purposes, and the remainder mostly colliery and general machine castings. At a few places tubing for colliery shafts forms the bulk of the work in hand, being supplemented by orders for pit corves and various small work.

The engineering establishments hereabout are not fully engaged, but at most of the leading ones there is what may be termed a pretty fair amount of business doing on single shift working. The demand mostly runs on colliery, winding and pumping plant, and engines for working colliery ventilating fans. There is also an encouraging inquiry for steam hammers of improved construction, particularly for those which are stated to give a perfectly dead blow each stroke. The call for locomotives is not heavy, the only concern engaged in that particular branch in this immediate neighborhood being the Yorkshire Engine Company, Limited, Sheffield, which has a tolerable complement of orders in course of execution, mostly, I believe, on Indian account. This company made and erected a number of locomotives for the Poti and Tiflis line a short time ago. In this connection I may state that the annual meeting of the shareholders of the Yorkshire Engine Company was held at the works on Wednesday afternoon, when a report and statement of accounts of about an average kind were submitted.

The liquidator, Mr. Newsom, of the Albion Steel and Wire Company, Limited, Sheffield, has just declared a first dividend of half-a-crown in the £1, payable June 5th. The annual meeting of the shareholders of the Sheffield Steel and Manufacturing Company, Limited, was held at the works on Tuesday, Mr. Wigfield presiding. The statement of accounts submitted showed a profit for the year of £465, which was considered satisfactory, and was adopted by the shareholders. The annual report of the directors of Hydes & Wigfull, Limited, Sheffield, has just been presented to the shareholders, and states that the business of the year has been fairly prosperous. The gross profit of the twelve months amounts to £2800, making, with balance brought forward, £4257 available for dividend, which is recommended to be at the rate of 10 per cent. The dividend hereof is £235,000, of which £17,000 has been paid up.

From the United States our latest advices speak of the extreme keenness of the competition there between the home-made and our hardware, a struggle which is continually increasing in severity, and almost as continually ending in the defeat of the British goods. The New York correspondents of both the Sheffield daily papers have this week sent some details of the sheep shear and general shear trade competition, from which it appears that German and American goods are literally running our out of that market. I hear, however, that the German manufacturers are on the point of advancing their prices for tailors' shears, and also for some classes of edge tools. From Australia we again hear of large imports of American manufacturers—many of them articles which have heretofore been exclusively obtained from England.

In the coal trade there is a stronger feeling and rather more work doing, the natural result of the great strike of miners in Northumberland. Up to the present time several inquiries for steam coal have come to hand in consequence of the Northern dispute, and there can be no doubt that should the strike prove lasting, the great benefit would be derived from the influx of orders which would be thus directed here. Even now there is a disposition on the part of vendors to make better terms, but they are not as yet quite so sure of their footing as to hold out for an advance. Such, however, may be the case in another week or ten days, if the Northumbrians shall not have settled matters by that time. The miners employed at a number of the collieries in the Leeds district met on Monday, and discussed the desirability or otherwise of the South Yorkshire lodges joining the Miners' National Association, from which they withdrew some time ago. Resolutions were ultimately passed in favor of the proposition, and attempts are now being made to strengthen the union feeling among the men throughout the district. At the Mapperley Colliery, Derbyshire, the men are still on strike against a reduction. The pit belongs to the Glendon Iron Company, which has also collieries in Nottinghamshire, Leicestershire and Staffordshire, so that it is not hampered by scarcity of fuel.

The annual report of Wm. Cooke & Co. (Limited) shows a profit on the trade account of £1233, which would have been larger but for the strikes at the works and collieries supplying fuel. The trade account shows total expenses reaching £159,000, while the sales have been £165,000. The profit and loss account shows a loss for the year of £2238. The paid up capital is £101,000.

The American goods which have been sent over to Sheffield are selling, but only slowly. They attract a great deal of close, and I may say critical, scrutiny, and are gazed at by small crowds all day long. I think sometimes better worthy of inspection, however, might very well be sent over by your manufacturers.

THE WORLD'S COAL PRODUCTION.

The *Mining Journal* has been making calculations on this head, and says: "It is very difficult, if not impossible, to give the coal production of the various countries of the globe for any one year; but subject to this remark, we may state that the aggregate annual extraction of coal throughout the world is now computed at 275,000,000 tons or thereabout. In this vast total we find Great Britain figuring for no less than 133,300,000 tons, or 48 per cent. of the whole production. Some distinguished statesmen once observed that the country which had the most coal possessed also the most industrial power, and there can, we imagine, be little doubt that this was a just and sound observation; the only question, of course, is whether we are not exhausting our coal resources, and, in consequence, undermining our industrial strength. The United Kingdom raises annually about 4½ tons of coal per head of its population; in the United States the corresponding figure is little more than one ton per head. The Americans, probably, burn much more wood than the English; still, after making allowance for this, it is clear that Great Britain is a far more important country in respect of the development of manufacturing industry, and in respect also of the exportation of coal, than the United States of America.

"To return to the question of the world's coal production, it is interesting, and at the same time rather startling, to note that Germany now produces nearly 45,000,000 tons of coal annually, or 16½ per cent. of the estimated aggregate coal extraction of the human race. Although the Germans do not make quite so much noise as the Americans as regards their pursuits and proceedings, they are, nevertheless, pressing Jona-

than rather hard in the important matter of coal extraction. After the Germans the French rank next among the coal producing nations of the world, but there is a wide difference between the comparative coal extraction of Germany and France, the production of coal in France in 1875 having been only 16,949,000 tons, or 6.21 per cent. of the world's annual coal supply. Belgium stands fifth among coal producing countries, her annual extraction being returned at 14,407,000 tons, or 5.23 per cent. of the whole estimated supply. The Austro-Hungarian empire has attained to an annual coal extraction of 10,389,000 tons, or 3.81 per cent. of the general aggregate. Although Russia is of vast extent, the Czar's great empire has not made much progress as regards coal mining, the Russians raising only 1,940,000 tons annually, or just 0.49 per cent. of the globe's production. The comparatively young British colony of New South Wales raises almost as much coal as Russia, having produced in 1874, 1,298,000 tons."

STAFFORDSHIRE AND BIRMINGHAM.

At the 'Change meetings in these districts last week there was rather more activity in some respects, although it must still be stated, as a general fact, that the trade is quiet and dull all round. For merchant brands there was, and is, little demand, although many of the commoner kinds are being pressed on the markets at very low prices, and in lots small enough to suit the most limited requirements. For shipbuilding iron and for galvanizing sheets, however, there was a readier sale at Birmingham on Thursday, and several fair sized parcels of the latter kind changed hands at prices which ranged at from £8 to £8.5 per ton. Sheets for stamping and brazing purposes, too, were rather more sought after, the latter ranging at £7.15 to £8 per ton, and the former at £1 to £1.10 more money. In best branded boiler plates there is a fair business, quotations being from £9 to £11 per ton. It is stated, and also contradicted, that Messrs. G. B. Thornycroft & Co., of the Shrubbery Iron Works, near Wolverhampton, have decided to offer for sale by private contract all their mines, mills and furnaces. This firm some time ago gave all the workmen notice to leave on June 24. The Staffordshire and Shropshire tin plate manufacturers do not appear inclined to unite with the Welsh masters in limiting the output, chiefly on the grounds that they (the former) are now fairly engaged, and that their whole output is infinitesimal compared with that of South Wales.

SOUTH WALES AND MONMOUTHSHIRE.

Last week's exports of railway iron from Newport reached 410 tons, and from Cardiff 1507 tons. It is understood, nevertheless, that the Rhymney, Landore, Tredegar, Beaufort, Dowlais and Ebbw Vale works are much busier. Many of these establishments hold good busier orders, but have plenty of time given them for deliveries. Most of the new contracts for rails are for Canada, Spain, India and Australia. At the Forest of Dean Works the production is not large. Last week several slight explosions occurred in the Nantyglo Colliery, and by one of them a fireman was killed, a number of other men being also rendered insensible by the after damp.

THE METAL MARKETS

have been tolerably steady. On the Lombard Exchange, London, on Friday, copper was fairly steady, a small business being done in it. o. b. Chili bars at £68. 15 on the spot. Wal-laroo was irregular at £76 to £77; Barra, quiet at £74. 10; English tough, £74. 10 to £76; best selected, £75. 10 to £77; strong sheets, £81, and Indiana sheets, £80. Tin ruled quiet, there being small sales of Straits at £69, and of Australian, £68. 5 to £68. 10. English ingots were £73. 10 to £74, and were only in limited request. Lead melted off somewhat more freely, English being held at about £21 to £21. 5. Spelter and quicksilver closed steady.

Messrs. Kelly & Co. (London), thus report: "The metal market is thought by some to have improved somewhat. Restricted production, perhaps, has had something to do with the generation of this notion. Nothing positive indicates increased demand, and it is not thought that further reductions in values will help very much in that direction. The iron trade, every where, is spoken gloomily of, and every manufacturer is said to be working at a loss, and further wages reduction is pointed at as the only means of revival. In the North of England pig iron keeps almost uniformly steady, and additional furnace lighting does not look like blind anticipation of losses thereon. Scotch fluctuations are no new thing, whether times happen to be good or bad. Notes from Mid-dleborough, with its enormous make, should have more weight than Glasgow, and Middles-brough, upon the whole, exhibits comparative firmness as to values, and the dispersion hither and thither of more than an average quantity of pig! Copper, inactive. Tin, dull. Tin Plates, same. Lead, quiet. Spelter, same as last week. Quicksilver, unaltered."

There is no appreciable change in the Liverpool market.

Iron: f. o. b. in Liverpool, per ton.

	£ s. d.	£ s. d.	£ s. d.
Merchant bar.....	6 12	6 12	6 12
Merchant bar, in Wales.....	6 8	6 8	6 8
Staffordshire.....	7 0	6 10	6 10
Hoop.....	7 10	6 10	6 10
Sheet.....	8 15	6 10	6 10
Nail rod.....	7 10	6 8	6 8
Bar best.....	7 0	6 8	6 8
Boiler plates.....	9 0	6 10	6 10

Tin Plates: f. o. b. in Liverpool, per box.

	£ s. d.	£ s. d.	£ s. d.
Charcoal, I. C.....	1 2	0 1	4 0
Coke, I. C.....	0 18	0 1	0 0

Copper: Delivered in Liverpool, per ton.

	£ s. d.	£ s. d.	£ s. d.
Bolt and Sheathing.....	84 0	0 0	0 0
Tile.....	78 0	0 0	0 0
Tough cake.....	78 0	0 0	0 0
Best selected.....	78 0	0 0	0 0

The New Patent Law of the German Empire.

The following is the text of the new Patent Law of Germany, passed by the Reichstag, May 1st, to go into operation July 1st.

SEC. 1.—RIGHT OF PATENT.

ARTICLE 1. Letters Patent will be granted for new inventions which are of industrial utility.

The exceptions are:

1st. For inventions the use of which would be contrary to public morals.

2d. For inventions of ailments, medicaments, luxury and chemical products, except so far as a relation to the process of production.

ARTICLE 2. An invention shall not be considered new if at the time of application, as required by this law, said invention has already been described in the public prints, or has been publicly used in the country, in consequence of which other men of practical experience might have used it.

ARTICLE 3. Only that person or those persons who have duly and legally made application shall have claim to the grant of Letters Patent therefor. The applicant's claim to a patent shall be refused if the essential contents of his application shall trespass upon the right of another without his consent, in respect to his descriptions, drawings, models, instruments or contrivances, and in order to guard against this, a caveat can be entered.

ARTICLE 4. The Letters Patent forbid any person or persons, without the permission of the patentee, to sell or expose for sale, or cause to be sold or exposed for sale, the article of the invention. If the product consists of a machine or other mechanical contrivance, an implement or other such tool, the same being claimed by the inventor, the patent gives the power to forbid any person, without the consent of the patentee, from applying the product or making use of the article.

ARTICLE 5. The protection of the patent shall not be efficacious if at the time of the application by the patentee the invention has already been in use, or the requisite preparations have been made to bring it into use in this country. The protection of the patent shall further not be granted if the invention is found to be of benefit to the army, navy or the state, subject to the decision of the Lord Chancellor. The patentee, however, in this case possesses the right to claim compensation from the realm or state, which, in his particular interest has moved for the restriction of the patent, and in default of a proper understanding existing a suitable compensation will be made by the government. The grant of patent shall not be given for contrivances made to vessels or ships occasionally visiting this country.

ARTICLE 6. All rightful claims in connection with the grant of a patent become hereditary. The claim to the right of patent can be restricted or unrestricted by agreement, or can be transferred to another person by will or testament.

ARTICLE 7. The patent shall remain in force fifteen years, reckoning from the day on which the application was made. If the purpose of an invention of the applicant should prove to be an improvement upon an already patented invention, belonging to another person, he may petition for the grant of a supplementary patent, which shall terminate at the same time with the original patent.

ARTICLE 8. On delivering the grant a fee of thirty marks will be charged for every patent, and with the exception of the supplementary patent (Article 7) with the beginning of the second year, a fee of fifty marks will be charged, and a progressive addition of fifty marks for every succeeding year. If a patentee shall show that he is too poor to pay the established fees, the charges for the first and second year may be remitted; but in this case the patent expires in the third year.

ARTICLE 9. The patent becomes extinct if the patentee renounces his claim thereto, or if the fees are not paid at least three months after becoming due.

ARTICLE 10. The patent shall be declared invalid if it can be proved—

1st. That the invention was not patented according to Articles 1 and 2.

2d. That in the essential contents of the application, the descriptions, drawings, models, instruments or contrivances of another have been trespassed upon without the consent of the possessor.

ARTICLE 11. The patent can be withdrawn after three years—

1st. If the patentee does not put his invention into practical operation to a suitable extent in this country, or neglects to do everything requisite to insure these achievements.

2d. If it should seem necessary to the public interest to offer the grant of permission for the use of an invention belonging to another, although it should be objected to on part of the patentee, this permission will be granted for a suitable compensation and a satisfactory guarantee.

ARTICLE 12. If the applicant does not live in this country his grant of patent and right thereto is only made available if he has a representative in the country. The said representative will only be accepted if he fulfills the requirements of the law, as well as undertakes all necessary civil lawsuits for the patentee. Should any lawsuit be entered against the patentee, the case can be heard in the circuit in which the representative dwells. Where this is not possible, the case is tried in the circuit in which the Patent Office is located.

SECTION II.—PATENT OFFICE.

ARTICLE 13. The granting of the declaration of invalidity and the withdrawal of the patent is effected by the Patent Office. The site of the Patent Offices in Berlin. It consists of, at least, three permanent members (including the president), and the members appointed for special duties. The members are appointed by the Emperor; the rest of the officials by the Lord Chancellor. The permanent members are named by the Bundesrath. In case they already occupy an office in the service of the state the duration of the membership in the Patent Office is as long as the members hold an appointment under the crown; otherwise it is for life. The appointment of other than life members is for five years. Of the permanent members at least three must possess judicial or high executive qualification. Those who are appointed for five years must be experts in some technical pursuit.

ARTICLE 14.—The Patent Office consists of several departments, which cannot be changed until after twelve months. A member may belong to several departments. A meeting of the department must be sufficiently well attended to give a quorum in the case of granting a patent, and a quorum consists of at least three members, of whom two must be non-permanent. A special department will be formed for the purpose of deciding the invalidity or withdrawal of patents. A quorum in this department must consist of two members, inclusive of the president (who must possess the ability of a judge or of a solicitor) and three other members. For other decisions, the presence of three members is sufficient. The statements of the civil court rules will be found to apply to the exclusion or refusal of judges or magistrates. For consultation, the services of experts who are not members may be secured, but they cannot give their vote in matters which require a decision.

ARTICLE 15. The decisions and decisions of the departments are made in the name of the Patent Office, and shall be accompanied with reasons officially drawn up in writing for the parties interested. Notices that payments are due will be sent by registered letter through the post, for which an acknowledgment of receipt will be returned. If a notice, etc., cannot be transmitted in the country, it can be effected by one of the officers appointed by the Patent Office, on delivery at the Post Office, according to the measures prescribed in Articles 161 and 175 of the Civil Court rules. Protests may be made against the decision of the Patent Office.

ARTICLE 16. If

and the duration of the patent, as well as the name and residence of the patentee; also the name of the representative if one has been appointed. The beginning, the termination, the invalidity, the definition and the withdrawal of the patent must simultaneously appear in the *Imperial Gazette* and be entered in the register. Should the patent change hands, or a change take place in the representative, if it come to the knowledge of the Patent Office authentically, this shall also be entered in the register and published by the *Imperial Gazette*. As long as this remains undone the former patentee and his representative are, according to this law, bound and entitled to the patent. The inspection of the register, the descriptions, drawings, models and patterns are open to everybody as far as it does not effect a patent taken out in the name of the Regency for military or naval purposes. The Patent Office publishes (as far as is allowed for inspection) the descriptions and drawings in their essential parts in an official paper. This is in addition to the publication which must appear in the *Imperial Gazette* as required by law.

SECTION III.—PROCEDURES IN THE AFFAIRS CONCERNING PATENTS.

ARTICLE 20. The announcement of an invention for the purpose of obtaining a grant of patent, must be effected by a written application to the Patent Office. For every invention a special notification is required. The announcement must contain the proposals for the grant of the patent, and the proposals must contain an exact description of the article which shall be protected by a patent. In one of the plans the invention must be so plainly and concisely described that its utility can be at once discerned by experts. It is also necessary that the requisite drawings, sketches, models and patterns shall accompany the application. The Patent Office will give directions when additional material must accompany the application. Alterations in the text of an application can be made until the time of publishing the application. When the application is made 20 marks will be charged for the cost of the procedure.

ARTICLE 21. If the prescribed demands are not complied with, the Patent Office requires from the patentee that those deficiencies shall be rectified within the time allotted. If not complied with within the given time, the application will be rejected.

ARTICLE 22. If the Patent Office consider the application to be in proper order and worthy of the grant, then the application will be published. With the notification the patent will become operative in favor of the patentee. (Articles 4 and 5.) If the Patent Office is of the opinion that an invention worthy of a patent is not in accordance with Articles 1 and 2, the application will be refused.

ARTICLE 23. The publication of the application must be effected in the following manner: The name of the applicant and the essential contents of his application shall be published in the *Imperial Gazette*. At the same time the application, with all the appurtenances, shall be exposed to public view at the Patent Office. When published, the advertisement must mention that the application in the meantime is protected against piracy. If an application be made for a patent in the name of the Regency, for military or naval purposes, the application and appurtenances shall not be exposed to public view.

ARTICLE 24. The Patent Office shall determine respecting the granting of the patent at the end of eight weeks after the day of publication (Article 23). In the meantime objections can be raised by the Patent Office against the grant. The objection must be made out in writing and furnished with the reasons. They can only be sustained by proving that the invention is not new, or that it is not in accordance with Article 1, Section 3, second paragraph. Before the decision, the Patent Office can have the arguments of the parties interested, as well as the opinion of experts, in that particular branch, and avail themselves of other means for the formation of an intelligent opinion.

ARTICLE 25. The applicant can protest against the refusal of the application, and against the refusal to grant a patent. In this case the applicant or his representative must hand in his protest within four weeks after the decision. For the cost of legal proceedings of the protest twenty marks must be paid at the time of handing in the protest. If the payment is not forthcoming the protest will not be considered.

ARTICLE 26. If the grant of patent is finally decided to be valid the Patent Office orders a publication of the same to be made in the *Imperial Gazette*, and the Letters Patent are granted. Should the patent be refused, this is also to be published. The provisional protection does not extend to refused patents.

ARTICLE 27. The preliminaries of the proceedings for the declaration of invalidity or the withdrawal of a patent also takes place by application. According to Article 10, second paragraph, only the owner of the infringed patent is entitled to make the application. The tender is to be made in writing addressed to the Patent Office, and containing the facts upon which the applicant can support his rights.

ARTICLE 28. After the preliminaries of the proceedings are disposed of the Patent Office summons the patentee, giving him information of the application with directions to appear within four weeks and argue the same. If the patentee does not answer to the summons within the stated time the decision, according to the application, can be concluded without the citation or audience on the part of the person concerned, and with this decision every one of the affirmed facts of the proposer shall be accepted as proved.

ARTICLE 29. If the patentee opposes in due time, or, as in the case of the second part of Article 28, the decision does not immediately take place according to the application, the Patent Office will take the necessary steps to decide the question, first giving the applicant a copy of the defendant's answer. It can direct the examination of witnesses and experts. The instructions of the civil court rules will be found applicable to the purpose. The minutes of evidence are drawn up with the aid of a sworn secretary. The decision follows after the citation and audience of the persons interested. If it is intended to withdraw the patent for reasons mentioned in Article 11, the decision to which the tender refers and the threat of withdrawal, a statement of the reasons must be previously given and a suitable lapse of time fixed. In the decision the Patent Office reserves to itself the right to determine what amount of the costs of the proceedings shall be defrayed by the persons concerned.

ARTICLE 30. The courts of law are bound to afford the Patent Office all requisite legal assistance. The courts, on being petitioned, shall stipulate the penalty against witnesses and experts for non-attendance, or for refusing to give evidence or take the oath, as well as in producing an absent witness.

ARTICLE 31. On opposing the decision of the Patent Office (Articles 28 and 29), an appeal is permitted. The appeal shall be placed before the Imperial High Court of the Board of Trade. A written application must be sent to the Patent Office and confirmed by it within six weeks after the presentation. The cost of the proceedings shall be determined by the judgment of the court of law, according to the measures prescribed in Articles 28 and 29. For the rest the proceedings will be determined before the court by rule, which shall be drawn up by the court of law and confirmed

by the Imperial decree, with the consent of the Bundesrath.

ARTICLE 32. Concerning the language which shall be employed at the Patent Office, the same regulation shall serve as is determined by the rule of the courts of law. Petitions which are not drawn up in the German language will not be accepted.

SEC. 4.—OF PENALTIES AND COMPENSATIONS.

ARTICLE 33. Any person or persons knowingly making fraudulent use of an invention, contrary to the injunctions laid down in Articles 4 and 5, shall pay a penalty not exceeding five thousand marks or be sentenced to imprisonment not exceeding one year, beside being bound to compensate the injured person. The injured person alone shall be allowed to prosecute for imprisonment.

ARTICLE 34. If the Court shall give a verdict for the plaintiff the defendant must bear all the costs of publishing the sentence. The kind of publication as well as the lapse of time will be determined in the sentence.

ARTICLE 35. In lieu of the compensation prescribed in this law, the plaintiff can oblige the defendant to pay a fine not exceeding ten thousand marks. With this fine the defendant is clear of all further demands in this case.

ARTICLE 36. That which is described in Article 13 of the law, concerning the establishment of a High Court of Justice, for the affairs of trade from June 13, 1869, is extended to those civil law suits in which an action a claim can be made available founded on this law.

ARTICLE 37. No action can be entered if the infringement has been in use three years.

ARTICLE 38. The court shall decide the extent of the injury, and the amount of compensation, after taking all circumstances into consideration, according to their own conviction.

ARTICLE 39. The punishment by fine not exceeding 150 marks, or imprisonment shall be enforced—

1st. Upon any person or persons who shall apply or affix a mark to an article or package for the purpose of misleading and deceiving the public and leading them to believe the article to be protected by Letters Patent.

2d. Upon any person or persons who shall make use of any notification in public advertisements on signboards, cards or hand-bills or any similar information for the purpose of misleading and deceiving the public, and thus causing them to believe the article to be protected by Letters Patent.

SECTION V.—CONDITIONS AFFECTING EXISTING PATENTS.

ARTICLE 40. Patents granted previous to the enforcement of this law remain in force until their expiration. An extension is not permissible.

ARTICLE 41. The owner of an existing patent can claim the grant of patent for the protection of his invention as prescribed by this law. The examination of the invention is submitted to the prescribed procedure of this law. A patent will be refused if another person shall also claim the right to the invention before the final decision is made of permitting a grant to the first claimant of the said invention. The grant of patent shall only then be refused on account of want of novelty if the invention was not new in this country at the time it was originally patented. In granting a patent according to this law an existing patent for the same invention becomes null and void (Article 40) if another invention of the same kind proves of considerable more use; but as far as this is not the case the patent for the original invention shall remain in force until the expiration of the term, when a new patent may be taken out for the later invention, and may come in force immediately after the expiration of the old patent.

ARTICLE 42. For the legal duration of a patent granted according to the provisions of Article 41, the time will be deducted during which the invention of the oldest of the existing patents has been protected. The patentee is bound to pay the legal fees as long as the patent remains in force. The day of payment and the annual amount of the fees will be determined according to the time when the invention first received protection in this country.

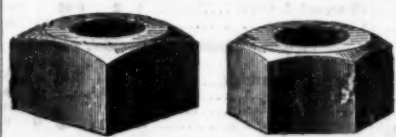
ARTICLE 43. By the grant of patent as prescribed in Article 41, persons will be allowed to make full use of their inventions at the time of application for a grant, but without injuring the right of patent, or they can make the required arrangements to bring the invention into use.

ARTICLE 44. This law shall go into effect on the 1st of July, 1877.

Against the steam tram car already in use at Brussels, is about to be tried competitively a new fireless locomotive, built at Verviers by Bede & Farcot. The motive force is steam, disengaged from water heated under a pressure of twelve atmospheres. The patentees of the new locomotive are its builders and the General Tramways Company.

NEW HAVEN NUT CO.

MANUFACTURERS OF



Hot Pressed Square and

Hexagon

NUTS.

Post Office Address, Westville, Conn.



Sash Holder & Lock.

Sold by many of the principal Hardware Dealers throughout the country. For efficiency, durability and convenience it is proved to be superior to any other sash holder and lock. On receipt of 25c. samples will be sent by mail, prepaid, with price list and description. C. E. STELLER, 914 Walnut St., Milwaukee, Wis., patentee and sole manufacturer.

Steel Name Stamps.

N. Y. STENCIL WORKS, 87 Nassau St., New York.

Established in 1854.

STEPHENS & CO.,

MANUFACTURERS OF

U. S. Standard Boxwood and Ivory Rules.

Also Exclusive Manufacturers of

L. C. Stephen's Patent Combination Rule.

RIVERTON, CONN.

Rules graduated in foreign measure to order.

The Cowles Hardware Co.,

UNTONVILLE, CONN., Manufacturers of

Hardware & House Furnishing Goods

GEO. DUNHAM, Pres. G. S. KNAPP, Treas. MARTIN COWLES, Sec.

Screw Drivers of all varieties, Box Scrapers, Box Openers, Garden Hoes, Garden Jaws, Border Knives, Mining Knives, Fish Turners, Butter Knives, Cake Turners, Cleavers, Hammer, Carpet stretchers, Tack Claws, Marking Awls, Carpenters' Awls, Awls, Ice Awls, Carriage Jacks, Nail Sets, Bush Hooks, Ice Axes, Ice Tonges, Patent Mouse Traps, Vegetable Slicers, Sift Braces, Butts and Spiral Springs, Ferris, Ham Trays, Ham Stringers, Oyster Knives, Cold Chisels, Hauls, Solid and Prick Patches, Box Hooks, Bow Pins, Bull Ring Needles, Bull Rings, Bill Hooks, Blind Adjusters, Curling Irons (Wrought), Cork Screws, Cattle Loaders, Corn Hooks, Door Springs, Kalves (Kitchen), Saw Sets (Hart's Patent), Saw Sets (Allen's Patent), Saw Sets (Improved Bench), Spoons (Table and Tea), Washers (Tin and Iron), Knobs Rings a specialty, and Implement Screw Drivers, Hercules Reverse Action Door Spring and Restainer, Gear Air Cushion Door Spring Catalogues and Circulars sent on application.

J. CLARK WILSON & CO., Agents, 51 Beckman St., New York. SAMUEL G. B. COOK & CO., Agents, Baltimore, Md.

HARPER'S LUBRICATOR

For Steam Engines.

This invention is an improvement upon that class of Steam Lubricators in which the lubricating material is floated (not by hydrostatic pressure) from the reservoir by the condensation of steam passing into the reservoir, and is susceptible of being applied to all kinds and styles of Steam Engines, by introducing the Lubricator to the steam pipe it has created friction, so that it carries its own friction antidote to the valve, piston and rods, reducing friction, thereby saving oil, coal and packing.

The glass tube connected to the reservoir indicates the quantity of oil in the reservoir; the upper glass tube conveys to the eye the intelligence of the quantity of oil escaping. We might claim great economy of oil; that we leave with the engineer. We have made ample provision for large quantities, but at the same time it can be so regulated as to be used in small doses.

This invention is in practical operation, and is highly indorsed by all those that are now using it.

Information concerning the LUBRICATOR may be obtained from

The Harper Steam Lubricator Co.,

WESTVILLE, CONN.,

Or of

F. H. WILLIAMS,

206 Broadway, Room 34, New York City.

1865. THE PEERLESS CLOTHES WRINGER. 1877.

No Deviation from Regular Rates.

No. 2, \$66.00.	No. 3, \$74.00.
White	Wrought Iron
Rubber Rolls,	Thumb screws,
Metal	Apron or
Journal Boxes,	Clothes Guard,
Patent Crank	Hickory
Fastening,	Spring Bar
Rubber	and
Fastening Pads,	Rubber Springs,
Maple	Perfect
Wood Frames.	in Finish.
Simple,	Send for
Durable,	Circular.
Efficient.	

Warranted Double the Capacity of any Purchase Gear Wringer.

A. H. SPENCER,
Solicitor of Patents,
And Expert in Patent Cases.
28 State St., Room 19, Boston

"TORREY'S DOOR SPRINGS"

P. R. DUNNE,
Successor to E. S. & J. TORREY,
SOLE MANUFACTURER,
169 Fulton St., New York.

Ice Cream Freezers.

AND

Hot Pressed Square and Hexagon NUTS.

WM. I. NICOLLS,
CIVIL ENGINEER,
Manufacturers Agent in
RAILROAD SUPPLIES
5 Post Office Ave., Baltimore.

Follansbee Double Propeller Pump.

Medal and Diploma Awarded, Centennial Exposition, Philadelphia, 1876.

KILVERT & TAPPAN, General Agents,
Room 38, Simmons Building, Cor. Water and Congress Sts., Boston, Mass.

WILSON BOHANNAN,

Manufacturer of Patent

BRASS Pad Locks,

FOR

Railroad Switches, Freight Cars, AND THE HARDWARE TRADE.

All sizes, with Brass and Steel Keys, with and without chains.

PASSENGER CAR LOCKS,

Bronzed, Nickel-Plated and Japanned.

BROOKLYN, N. Y.

Catalogues and Samples sent upon application.

ROMER & CO.,

Established 1857. Manufacturers of Patent Scandinavian or Jall Locks, Brass Pad Locks for Railroads and Switches, Also, Patent Stationary R. R. Car Door Locks, Patent Piano and Sewing Machine Locks. 141 to 143 Railroad Avenue, NEWARK, N. J. Illustrated Catalogue sent on application.

ESTABLISHED 1835

BEMIS & CALL

ALL GOODS STAMPED BEMIS & CALL CO. NO OTHERS GENUINE

PYROMETERS

for BLAST FURNACES.

Edw. BROWN,
311 Walnut St., Philadelphia.

ALSO FOR SALE

PYROMETERS

For Baker's Ovens, Boiler Flues, Galvanizing Baths, Oil Stills, Vulcanizers, Superheated Steam. Over 400 "Gauntlett" and 150 Portable Pyrometers are now in use at Blast Furnaces. E. Brown's Portable Blast Gauge for the plug hole, Steam Gauges, Blast Gauges, Mercury Gauges, Recording Steam Gauges, Engine Counters, Indicators for ascertaining the Horse Power.

REVOLUTION INDICATORS.

which constantly indicate without the use of a watch, the number of turns per minute made by a Steam Engine

PATENT CONVEX Fluting & Smoothing Iron.



1st. It can be used as an ordinary Smoothing Iron. 2d. It is a Fluting Machine as well as a Smoothing Iron. 3d. The Fluting Attachment being made of brass and convex in form, it has all the advantages of the crank machine. 4th. It combines the two articles in one, taking up the room of but one machine, and is always ready for use.

A. A. WEEKS, Manufacturer,
No. 29 John Street, New York.

STEAM ENGINES

CLIPPER Vertical Engines, off and on wheels! Price on wheels, 4 horse-power, \$485; 8 horse on wheels, price, \$700. Dry Steam Horizontal Engines, 8 horse power Climax, on wheels, \$925. Builders of Stationary Engines, 4 s'yls., from 6 to 200 horse power. Corliss Engines, Extra Finish and Cut-Off Engines, Crank, Stationary and Plain Finished Engines. Boilers, Circular Saw Mills, &c. Successors to Utica Steam Engine Co., formerly Wood & Mann. Established 1857. We have the largest line of Engine Patterns in the United States. TAYLOR MANUFACTURING CO., Westminster, Maryland.

TACKS, LINING AND SADDLE NAILS

UPHOLSTERS, GIMP, CARPET, BRUSH TACKS, CIGAR BOX, FINISHING, PATENT BRAYS, SHOE NAILS, AND SHOE TACKS, BRASS SILVER AND JAPANESE, LINING NAILS, SADDLE NAILS, LOFTIN TACKS, TUFFING, BUTTONS, AND NAILS, UP ANY COLOR.

AMERICAN TACK CO.

Factory at Fairhaven, Mass. N. Y. Salesroom, 117 Chambers Street.

COMMON, CHISEL POINTED, AND COPPER BOAT NAILS. ANY SIZE OR STYLE OF TACK OR NAIL MADE FROM SAMPLE TO ORDER.

NATIONAL Horse Nail Co.

MANUFACTURERS OF

FINISHED

[BRIGHT OR BLUED]

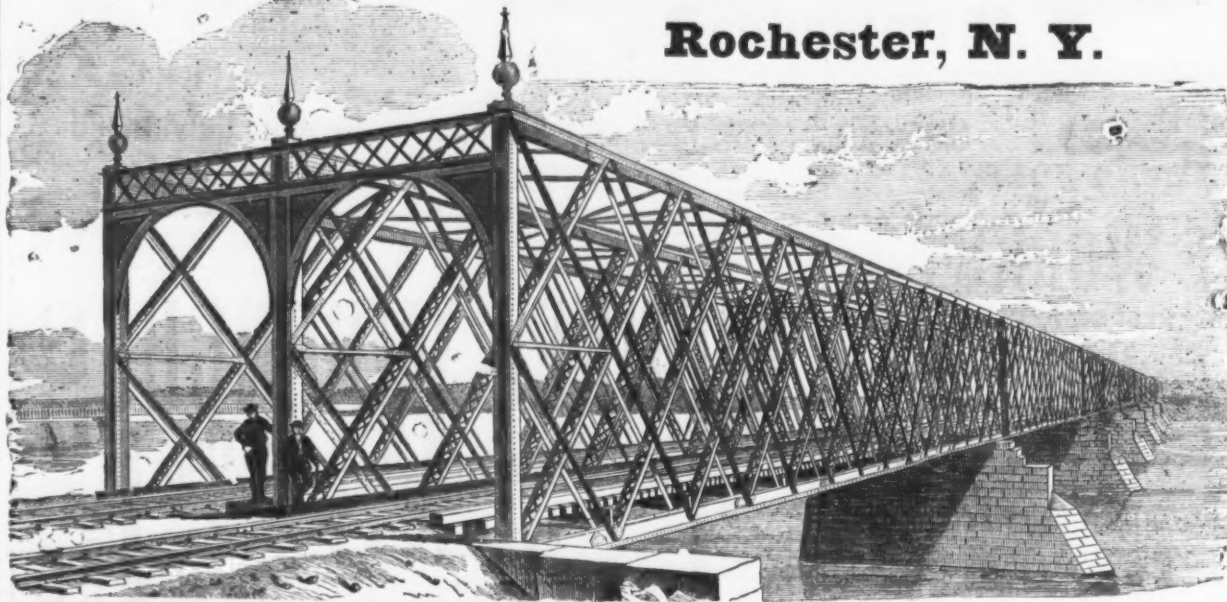


These nails are made of the best brands of **NORWAY IRON**, and are guaranteed to be equal to any in the market.

NATIONAL HORSE NAIL CO.,
VERGENNES, VT.
HORACE DURRIE & CO., Agents,
No. 97 Chambers St., New York.

LEIGHTON BRIDGE AND IRON WORKS,

Rochester, N. Y.



Wrought Iron Riveted
Lattice Railroad

AND

HIGHWAY BRIDGES.

Wrought Iron

WATER PIPE.

The most economical and durable Pipe manufactured for Water Works, Oil Lines or Gas Mains.

General Riveted Work

Orders Solicited from Civil Engineers and Contractors.

[Accompanying engraving represents the Springfield Bridge, built by the Leighton Bridge and Iron Works.]

L. COES' SCREW WRENCHES.

Genuine Improved Patent

Manufactured by

L. COES & CO.,
Worcester, Mass.



We invite the particular attention of the trade to our New Straight Bar Wrench, widened, full size of the larger part of the so called "reinforced or jog bar." Also our enlarged jaw, made with ribs on the inside, having a full bearing on the front of bar (see sectional view), making the jaw fully equal to any strain the bar may be subjected to.

These recent improvements in combination with the nut inside the ferrule firmly screwed up flush, against square, solid bearings (that cannot be forced out of place by use), verifies our claim that we are manufacturing the strongest Wrench in the market.

We would also call attention to the fact, that in 1869 we made several important improvements (secured by patents), on the old wrench previously manufactured by L. & A. G. Coes which were at once closely imitated and sold as the *Genuine Wrench* by certain parties who seem to rely upon our improvements to keep up their reputation as manufacturers, and although the fact of their imitating our goods may be good evidence that we manufacture a superior Wrench, we wish the trade may not be deceived on the question of originality. Trusting the trade will fully appreciate our recent efforts, both in improvements on the Wrench and in the adoption of a Trade Mark, we would caution them against imitations. None genuine unless stamped

L. COES & CO."

Warehouse, 97 Chambers St., & 81 Reade Sts., N. Y.
HORACE DURRIE & CO., Sole Agents.



THE AMERICAN WIRE NAIL CO.,

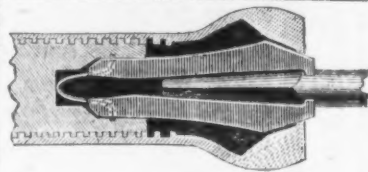
Manufacturers of

Molding, Trimming, Upholstering & Finishing Nails,
Escutcheon Pins and Wire Nails

Off all kinds and sizes, with Flat, Oval, Depressed, or Countersunk Heads, with or without points.
Warranted Well Made and of Superior Quality.

Lock Box 853,

OFFICE AND WORKS, Covington, Ky.



This Cut Represents the Jaws of the Barber Bit Brace.

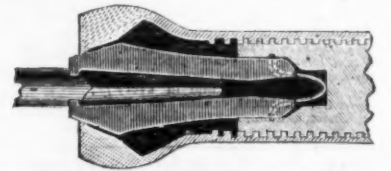
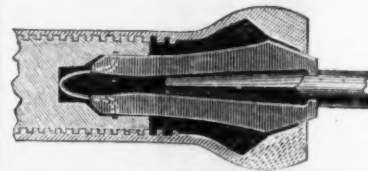
The United States Court recently decided that the Millers Falls Company has the exclusive right to make this style of Brace Jaws, and a higher court long ago decided that they are the only jaws which will hold tools of any size or shape.

All of our Brace Jaws are now made of forged steel, and are nearly indestructible, which is true of no other brace.

We shall make our goods perfect in every respect, and sell them at reasonable prices without trying to compete with inferior goods. We think in the end this will be for the interest of both manufacturers and dealers.

MILLERS FALLS COMPANY,

No. 74 Chambers Street, NEW YORK.



THE EAGLE ANVIL!! WARRANTED!!

(ESTABLISHED) 1843.



These Anvils are superior to the best English, or other Anvils, on account of the peculiar process of their manufacture (invented and used only by this concern), and from the quality of the materials employed.

The best English Anvils become hollowing on the face by continued hammering in use, on account of the fibrous nature of the wrought iron—causing it to "settle" under the face.

The body of the Eagle Anvil is of crystallized iron, and no settling can ever occur; the steel face, therefore, remains perfectly true. Also, it has the great advantage, that being of a more solid material, and consequently with less rebound, the piece forged receives the full effect of the hammer, instead of a part of it being wasted by the rebound, as of a wrought iron anvil. An equal amount of work can, therefore, be done on this Anvil with a hammer one-fifth lighter than that required when using a wrought iron anvil.

The working surface is in one piece of JESSUP'S BEST TOOL CAST STEEL, which, being accurately ground, is hardened and given the proper temper for the heaviest work. The horn is covered with and its extremity made entirely of steel. The body of the Anvil is of the strongest grade of American iron, to which the cast steel face is warranted to be thoroughly welded and not to come off.

Price List, October 1st, 1876. ANVILS weighing 100 lbs. to 800 .90 per lb.

Smaller Anvils, ("Minims.")

No.	Weight	Price
1	5 lb.	\$2.25
2	10 lb.	\$2.75
3	15 lb.	\$3.25
4	20 lb.	\$3.75
5	25 lb.	\$4.25
6	30 lb.	\$4.75
7	40 lb.	\$5.25
8	50 lb.	\$5.75
9	60 lb.	\$6.25
10	70 lb.	\$6.75
11	80 lb.	\$7.25
12	90 lb.	\$7.75

N.B.—These are the RETAIL PRICES. The only additional cost will be the freight to the purchaser's place of residence.

THESE GOODS ARE SOLD BY THE GENERAL AGENTS (with special discounts to the trades.)

New York.—Messrs. J. CLARK WILSON & CO.—RUSSELL & ERWIN MFG. CO.—Messrs. HORACE DURRIE & CO.
Boston.—Messrs. GEORGE H. GRAY & DANFORTH. Philadelphia.—Messrs. JAMES C. HAND & CO. Baltimore.—Mr. W. COLE
Louisville.—Messrs. W. B. BELKNAP & CO. **FISHER & NORRIS, Sole Manufacturers, Trenton, N. J.**

HOWARD PARALLEL BENCH VISE.

MANUFACTURED BY

Howard Iron Works,

Send for pricelist. Buffalo, N. Y.

RUSSELL & ERWIN MFG. CO. New York & Philadelphia Agents.



WM. HASSALL,

Manufacturer of

American and French

Wire Nails

With Flat, Round, Oval, Depressed, Screw and Fancy Heads.

Molding and Finishing Nails, with or without heads. Brush Makers', Upholsterers' and Undertakers' Finishing Nails a specialty. Shoe Nails of Brass and Iron. Bright Iron Rivets. Brass and Iron Escutcheon Pins, with flat, round and fancy heads, all sizes on hand and to order.

OFFICE AND WORKS: Nos. 63 & 65 Elizabeth Street, New York.

N. Y. MALLET and HANDLE WORKS

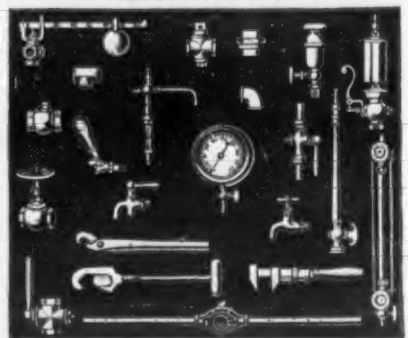


Manufacturers of
Calkers', Carpenters', Stone Cutters'
Tin, Copper and Boiler Makers'

MALLETS,

Hawking Beetles, Hawking and Calking Irons; also all kinds of Handles, Sledge, Chisel and Hammer Handles. Also

COTTON AND BALE HOOKS.
Patented Feb. 13, 1877; a new combination of Hooks.
436 E. Houston St., New York City.

EATON, COLE & BURNHAM CO.,58 John Street, New York.
MANUFACTURERS OFWrought Iron
PIPE,
Cast Iron
FLANGED PIPE,
Cast Iron
RADIATORS
and BOILERS.Brass & Iron
STEAM
Gas & Water
FITTINGS.
PLUMBERS'
MATERIALS.STEAM GAUGES, TOOLS,
And all Supplies used by Machinists, &c.**NATIONAL TUBE WORKS CO.,**

BOSTON, MASS., and McKEESPORT, PENN.

Wrought Iron Boiler Tubes,

STEAM AND GAS PIPE, ENAMELED WATER PIPE.

Wrought Iron Railroad Cars,

Saving of 25 per cent. dead weight, and increase of 50 per cent. in strength.

MACK'S PATENT INJECTOR, MOONEY'S PATENT VALVE.

All our Manufactures Warranted.

PEET VALVE CO.,

Manufacturers of Patent

Straight Way Valves

FOR

STEAM, WATER, GAS, &c.

152 Hampden St., Boston, Mass.

G. T. HILL, Jr., Treas.

N. H. SPAFFORD, Supt.

Send for Circular.

LEONARD BAILEY & CO., FACTORY, HARTFORD, CONN.
MANUFACTURERS OF
STANDARD MECHANICS' TOOLS. Sargent & Co., Agents.
WAREHOUSES,
37 Chambers St., New York.Trade Mark. Pat. Jan. 4, 1876.
Victor Planes. Pat. Dec. 12, 1876.
Circular Planes. Pat. April 10, 1877.
Dado Plane. Pat. March 28, 1871.
Try Squares. Pat. July 6, 1875.
Pat. May 9, 1871.
Pat. Dec. 8, 1874.
Flush T. Bevel. Pat. March 19, 1872.
Spoke Shaves. Pat. Oct. 3, 1876.
Box Scraper. Pat. Oct. 3, 1876.

The VICTOR PLANES are the product of twenty-two years' experience in manufacturing Iron Planes. They are simple, durable, and in every essential practical, cheap as the cheapest, and warranted the best.



Send for Illustrated Catalogue and Price List.

John T. Lewis & Bros.,
No. 231 South Front St.,
PHILADELPHIA.TRADE MARK.
MANUFACTURERS OF
PURE WHITE LEAD, RED LEAD,
Litharge, Orange Mineral,
Linseed Oil
AND PAINTERS' COLORS.The Atlantic White Lead and Linseed Oil Company,
MANUFACTURERS OFWhite Lead (Atlantic), Red Lead,
Litharge & Linseed Oil.
ROBERT COLGATE & CO.,
287 Pearl Street, New York.ESTABLISHED A.D. 1777.
WETHERILL & BROTHER,
MANUFACTURERS OF
WHITE LEAD,
RED LEAD, LITHARGE & ORANGE MINERAL.
OFFICES, 31st STREET, Below CHESTNUT, PHILADELPHIA.**Brooklyn White Lead Co.**White Lead, Red Lead and
Litharge.
89 Maiden Lane, NEW YORK.
FISHER HOWE, Treas.**JOHN JEWETT & SONS,**
Manufacturers of the well known Brand of
WHITE LEAD.TRADE MARK.
Also Manufacturers of
LINSEED OIL
183 Front Street, NEW YORK.

Pipe, Fittings, &c.

McNab & Harlin Mfg. Co.,

MANUFACTURERS OF

BRASS COCKS AND VALVES

For STEAM, WATER and GAS.

Iron Pipe and Fittings, Plain and Galvanized.

PLUMBERS' MATERIALS.

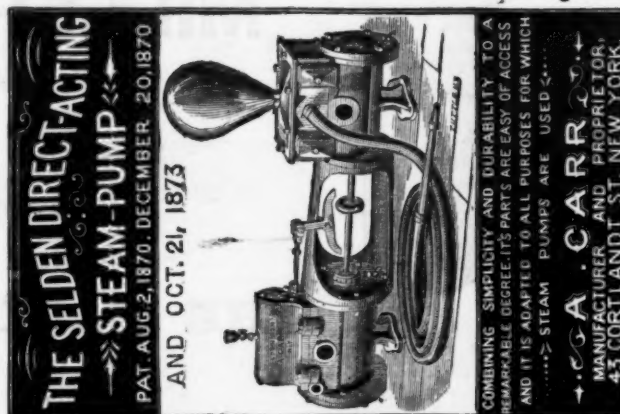
New Illustrated Catalogue and Price List sent by express to the Trade on application.

Factory, Paterson, N. J.

56 John Street N. Y.

MONKEY WRENCHESA STRONG, DURABLE AND CONVENIENT
TOOL,8 inch Wrench,
25 CENTS.

meeting the demand for a Screw Wrench, combining EFFICIENCY with a COST so small as to place it in the reach of every one using such tools. It will be found particularly well adapted for the Mowing Machine, Carriage, and general Farm use, from its compactness, while its Strength and Simplicity of construction renders it quite as serviceable as a tool costing three times its price.

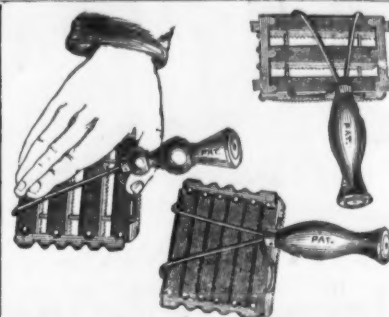
10 inch Wrench,
35 CENTS.FOR CIRCULAR, ADDRESS,
Box, 1996 P. O. PHILADELPHIA, PA.**THE RIDER COMPRESSION PUMPING ENGINE.**NO BOILER,
NO STEAM,
NO DANGER.

Uses air as a Motive Power.

VALVELESS, NOISELESS,

Requires no Skilled Engineer.

Costs only from FIVE to TEN CENTS per day for fuel.

Particularly desirable for supplying
RAILROAD TANKS, RESIDENCES, HOTELS, PUBLIC BUILDINGS, FRENCH FLATS, NURSERIES, FLORISTS, FOUNTAINS, IRRIGATING LANDS, &c., &c.**RIDER, WOOSTER & CO., Makers, Walden, N. Y.**GENERAL AGENCIES, where these Engines may be seen in operation daily.
BOSTON.—Geo. Dunbar & Co., 109 Milk Street.
NEW YORK.—Cammeyer & Sayer, 93 Liberty Street.
PHILADELPHIA.—Kelly & Ludwig, 720 & 722 Filbert Street.
CINCINNATI, O.—Cope & Maxwell Mfg. Co., 131 West 2nd Street.
INDIANAPOLIS, IND.—Kerick & Wingardner, 73 & 75 W. Maryland Street.
COLDWATER, MICH.—C. M. Van Every & Co., 171 & 173 Lake Street.
CHICAGO, ILL.—T. S. & A. J. Kirkwood, 103 N. 3rd Street.
ST. LOUIS, MO.—M. M. Buck & Co., June. Bush & Market Sts.
SAN FRANCISCO, CAL.—Huntington, Hopkins & Co., 52 to 58 K Street.
SACRAMENTO, CAL.—Huntington, Hopkins & Co., 52 to 58 K Street.**G. W. Bradley's Edge Tools.**Butchers' Cleavers,
Butchers' Choppers,
Axes and Hatchets,
Grub Hoe and Mattocks,
Nail Picks,
Box Chisels and Scrapers,Ring Bush Hooks,
Axe Eye Bush Hooks,
Socket Bush Hooks,
Watt's Ship Carpenters' Tools,
Carpenters' Drawing Knives,
Coopers' and Turpentines Tools.FOR SALE BY
MARTIN DOSCHER Agent, 96 Chambers Street, N. Y.**The Perfect Comb.**We call your attention specially to our new patent end-less wire comb. The result of a long series of experiments, made with a view to meeting all the requirements of a Perfect Comb. It is better, stronger, and more durable than any ever before invented. The raised wire shank gives what has never before been attained, viz: a rest and brace for the thumb, in such a position that the hand cannot come in contact with the horse while using the comb. The wire braces which run from the shank over the back to the front teeth give strength and durability in a direction never heretofore attained, and at the same time serve as an extra handle; and when clamped by the fingers in connection with the raised shank the comb is more firmly, easily, and completely held, and with much less fatigue to the hand than is possible in any other formation—in short, it needs but a trial to vindicate its name: **The Perfect Comb.****THE LAWRENCE COMB CO.**

Factory and Office,

382 2d Ave., cor. 22d St., N. Y.

WM. S. CARR & CO.

Sole Manufacture

CARR'S
PATENT
Water
Closets,
PUMPS, CABINET WOOD WORK, &c.
106, 108 & 110 Centre Street,
Factory, Mott Haven, NEW YORK.**R. D. WOOD & CO.,**
Philadelphia,
Manufacturers of**Cast Iron Pipe**

FOR WATER AND GAS.

Lamp Posts, Valves, &c.,

Mathew's Pat. Anti-Freezing Hydrants.
400 CHESTNUT STREET.**COIL CHAIN.****Agricultural Chain,
Wagon Chain.**

We furnish a better article for less money than any concern in the country.

Union Chain & Cable Co.,
Pittsburgh, Pa.

H. MORTON, President.

RIEHLÉ BROS. SCALES
AND TESTING MACHINES.Office and Works,
9th Street, above Market, Philadelphia.
Warehouses, 57 & 59 S. 4th St., above Chestnut, Phila.
New York Store, 95 Liberty Street,
Railroad Track Scales,
Coal, Hay and Cattle Scales,
Patented Furnace Charging Scales,
Warehouse and Platform Scales
Testing Machines of any capacity.
Send for illustrated price list, mailed free. Tests made daily. Reports copied and kept confidential. Special attention devoted to repair work. Skilful Mechanics sent to all parts of the country. All work guaranteed.**The Hubbel Screw Co.,**
LIMITED,

Are now prepared to sell, to approved parties, licenses to use the improvements in machinery for making Metal Screws, secured to them by Letters Patent, at the rate of fifteen dollars per month.

They are also prepared to contract for Machine Screws of every description made in solid dies.
Address**JOHN S. LENG, Treasurer,**
No. 212 Pearl Street, New York.
P. O. Box 3565.**LENG & OGDEN,**
212 Pearl Street, New York.**LANSDALL & LENG'S**
Patent Lever and Cam Valves.
LANSDALL'S PATENT
Steam Siphon Pumps.
IRON

Of every description, for domestic use and export.

TACKLE BLOCKS
BURR & CO.,Manufacturers of Waterman and Russell's
Patent Iron Strapped Blocks,
ALSO, MANUFACTURERS OF
ROPE STRAPPED BLOCKS.
11 PECK SLIP, NEW YORK.

factory than cords and weights, and much less
pense. Send for circular. Samples in work
models sent, prepaid, on receipt of 20 cents.
SECURITY BLIND FAST CO., Providence, R.
J. A. B. SWIFT, 9 Murray St., New York Agent.

SECURITY BLIND FAST CO., Providence, R.
 A. B. SWIFT, 9 Murray St., New York Agent.

Brick Presses,

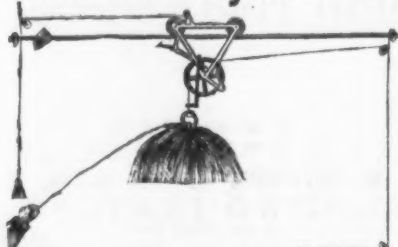
Oldest and Largest Establishment of the kind in the U. S.
F. L. & D. R. CARNELL,
 844 Germantown Avenue, Philadelphia
 Manufacturers of Pennsylvania Brick Machine,
 Little Giant Pipe Machine, Fire and Red Brick
 Presses, Clay Wheels, Tile Machines, Stampers,
 Grinding Pans. Brick Yards fitted out for running
 by steam or horse. Heavy and Light Castings. Send
 for circular.

FOUNDERS AND FURNACE MEN:

FOR
PURE CONNELLSVILLE COKE
 Send your orders to

H. C. FRICK,

Box 242. **PITTSBURGH, PA.**
WORKS at Broad Ford, Pa.
 (Near Connelleville, Pa.)
 Special attention given to the
 Manufacture of Coke for Foundries, Mal-
 leable Iron Works, &c.

American Hay Elevator

The most perfect and simple, and the only ele-
 vator that raises the hay from wagon and carries it
 back in the barn any distance required. It can also
 be used in stores, &c. This elevator received the
 highest award at the Centennial Field trial. Price,
 \$12, with large discount to the Hardware trade.
 Manufactured by the Patentee,

J. R. FITZHUGH,

1708 Barker St., Philadelphia.



The Cheapest and most
 Durable Paint known for
 Cars, Roofs, Bridges, Iron,
 Brick and Wooden Build-
 ings, etc. All Paint guar-
 anteed as represented, and
 trial orders solicited.

Pittsburgh
Iron Paint Co.,
PITTSBURGH, PA.

**FAC-SIMILES**

Centennial Award Medal
 Executed on Glass "en Relief," for outside show, from
 8 to 24 in. diameter, by the

Otto Stietz N. Y. Glass Letter Co.,
 611 Broadway.

Advertising Glass Signs a specialty.

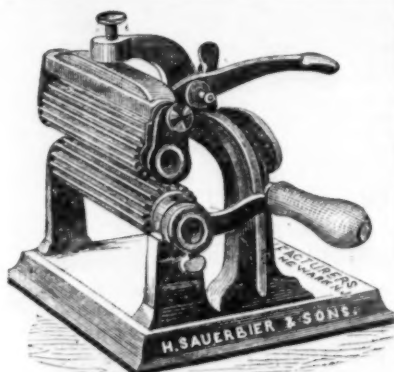
THE Covert Snap & Thimble,

For Horse and Cattle Ties.



Send for illustrated circular and price list of the
 celebrated Covert Harness Snap, Horse
 and Cattle Ties, Chains for Hitching
 Posts, Halter Chains, Rein Chains,
 Breast Chains, &c.
 Sample Snap sent by mail free of charge if desired.
 These goods are sold by all principal Jobbers in Gen-
 eral and Saddlery Hardware. Address

HOLD BACK & SNAP CO.,
 Sole Manufacturers, Troy, N. Y.



**KNOX AND IMPROVED KNOX
 PLUTING MACHINES.**

8 in. \$4.50; 6 in. \$3.00; 4 in. \$2.50.
 Extra Rollers—8 in. \$2.25; 6 in. \$1.75; 4 in. \$1.25.
 Plates—10, 12, 15, 18, 21, 24, 27 & 30, less discount—
H. SAUERBIE'S SONS,
 40 & 42 Mechanic St., Newark, N.

LEFFERT'S ENAMEL WORKS,

417 W. 24th St., N. Y.

Signs, Door, Number and Finger plates enameled in
 any color and decorated in any style.
 Illustrated catalogues furnished on application.
 Plumber's Materials, and every description of Wrought
 and Cast Iron Work enameled to order.

CUMBERLAND FIRE BRICK WORKS

Gardner, Stuart & Co.,

Manufacturers of

STANDARD SAVAGE FIRE BRICK.

OFFICE: Room 3, No. 56½ Fourth Ave.,
PITTSBURGH, PA.

WORKS: One mile from Mt. Savage Junction,
 Md., B. & O. R. R.

Illustrated Circulars and Price Lists on application.

PATENTS

THOS. D. STETSON,
 No. 23 Murray St., N. Y.
 Solicitor of Patents, and
 Scientific Expert in
 patent cases. Send for circular

TROY FIRE BRICK WORKS,

Jas. Ostrander & Son,

Established 1848.

Manufacturers of

FIRE BRICK,

Tuyeres, Tiles, Blast Fur-
 nace Blocks, etc.

Miners and Dealers in
 Woodbridge Fire Clay and Sand,
 and Staten Island Kaolin.

Price List, Diagrams of Fire Brick,
 and all other information cheerfully
 furnished on application.

TROY, N. Y.

JAMES OSTRANDER,
 FRANKLIN A. OSTRANDER, Surviving
 partner.

NEWTON & CO.,

Successors to

PALMER, NEWTON & CO.,
ALBANY, N. Y., Manufacturers

FIRE BRICK

Stove Linings,

Range and Heater Linings

Cylinder Brick, &c., &c.

B. KREISCHER & SON,

New York Fire Brick &

STATEN ISLAND

CLAY RETORT WORKS,

Established 1845.

Office, foot of Houston Street, East River,
NEW YORK.

The largest stock of Fire Brick of all shapes and
 sizes on hand, and made to order at short notice.

Cupola Brick, for McKenzie Patent,
 and others. Fire Mortar, Ground Brick, Clay and
 Sand. Superior Kaolin for Rolling Mills and Found-
 ries. Stone Ware and other Fire Clay and Sand,
 from my own mines at New Jersey and Staten Island,
 by the cargo or otherwise.

Watson Fire Brick Manufactory

ESTABLISHED 1836.

JOHN E. WATSON, Perth Amboy, New Jersey.

Manufacturer of

FIRE BRICK,

For Rolling Mills, Blast Furnaces, Foundries,
 Gas Works, Lime Kilns, Tanneries, Boiler
 and Grate Setting, Glass Works, &c.

FIRE CLAYS, FIRE SAND, AND KAOLIN FOR SALE.

A. HALL & SONS, Perth Amboy, N. J.

ESTABLISHED 1846.

HALL & SONS, Buffalo, N. Y.

ESTABLISHED 1866.

FIRE BRICK

of reliable quality for all purposes, manufactured of the
 best New Jersey Fire Clays. Also, ROCKINGHAM
 WARE, YELLOW WARE, Fire Clay, Fire Sand, Kaolin
 Ground Fire Brick, and Diamond Building Brick.

MANHATTAN FIRE BRICK

and Enameled Clay Retort Works.

ADAM WEBER, Proprietor.

Office, 633 E. 15th St., N. Y. Clay Retorts, Ena-
 melled for Gas Houses; Retorts for burning raw bone and
 re-burning bone for Bone Black. Fire Bricks, Fire
 Blocks, Cupola and Range Bricks of all shapes and sizes.
 The best fire clay from my own Clay Beds at Perth
 Amboy, N. J.

HENRY MAURER,

Proprietor of the

Excelsior Fire Brick & Clay

Retort Works,

Manufacturer of **FIRE BRICK, HOLLOW**

BRICK AND CLAY RETORTS.

WORKS: PERTH AMBOY, NEW JERSEY.

Office & Depot: 418 to 422 East 23d St., N. Y.

BROOKLYN CLAY RETORT

AND

Fire-Brick Works,

No. 88 Van Dyke Street, Brooklyn, N. Y.

Edward D. White, Surviving Partner of the late firm
 of J. R. Brick & Co.

M. D. Valentine & Bro

Manufacturers of

FIRE BRICK

And Furnace Blocks

DRAIN PIPE & LAND TILE.

Woodbridge, - - - N. J.

Troy Polishing Works.

STOVE ORNAMENTS

A Specialty.

No. 7 Sixth Street, **TROY, N. Y.**

THOS. A. ELGIE, Agent.

Go to BRASS GOODS MFG. CO.,

250 Pearl Street, N. Y., for

Indestructible Business
 Silver Trade Dollar
 Printed Back Mirror
 Gold Twenty Dollar
 Gold Back Mirror
 Useful beside being

Also all kinds of Press or Die work done cheaply,
 satisfactorily, promptly and well.

Manufactured by

STEAM

PUMPS

Crane Bros. Mfg. Co

CHICAGO.

COOKE & BEGGS, Agents

16 Cortlandt St., N. Y.

HOWSONS'

OFFICES FOR PROCURING

UNITED STATES AND FOREIGN

PATENTS,

Forrest Buildings,

119 SOUTH FOURTH ST., PHILADELPHIA,

AND MARBLE BUILDINGS

605 Seventh St. (Opposite U. S. Patent Office,
 Washington, D. C.)

H. HOWSON, Solicitor of Patents.

C. HOWSON, Attorney at Law.

Communications should be addressed to the
 PRINCIPAL OFFICES, PHILADELPHIA.

DEALERS AND CONSUMERS**OF FILES**

SHOULD PURCHASE THE

Nicholson or "Increment Cut" File

FOR THE FOLLOWING REASONS:

First.—They are made from the best quality of File Steel.

Second.—Each File undergoes a careful inspection after each operation, by
 critical inspectors, and none but perfect work allowed to pass.

Third.—They are cut by the "Increment" or irregular cut, therefore
 combine the advantages of both Hand and Machine work.

Fourth.—They will finish finer than Files of any other make of same de-
 gree of coarseness.

Fifth.—They will not "pin" or scratch like hand-cut Files.

Sixth.—The "Increment cut" File, by our records, will remove more
 stock with a given number of pounds applied than any other File with
 which we are acquainted

Seventh.—All Files under seven inches are put up in boxes of one dozen
 each, and neatly labeled.

Eighth.—The large stock carried by us, combined with our superior facilities,
 enables us to fill the largest orders at the shortest possible notice.

Ninth.—We are constantly making careful tests of our Files by delicately con-
 structed machinery, which automatically records the actual power applied,
 forward, backward and downward, at each stroke of the File, also the number of
 strokes, combined with the work performed, enables us not only to judge of the
 quality of our Steel for wear, but also of the cutting qualities of the
 File, and the ease (expressed in pounds) with which a given amount of work can be
 accomplished.

Finally.—Our Files are warranted to be hard, well cut and sound.
 They are exclusively used by many of the largest Railroads and Machinists in the
 country—and the vigorous growth of our reputation, not only for making a good
 article, but of our ability to furnish a good article cheap, is evidenced by
 the large number of Dealers and Jobbers who are handling our Files exclusively.

NICHOLSON FILE COMPANY, Providence, R. I.

SOLD BY HARDWARE DEALERS GENERALLY.

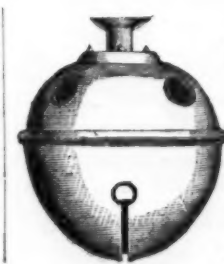
Lester Oil Co.,

81 MAIDEN LANE, N. Y.

Exclusive manufacturers of the Renowned

Synovial Lubricating OILS.

The most Durable, Reliable & Eco-
 nomical Lubricant in existence;
 Applicable to every grade of machinery. Send for Cir-
 cular and Price List.



Established 1838.
Bevin Bros. Mfg.
Co.,

Easthampton, Ct.,

Manufacturers of

SLEIGH BELLS.

House, Tea, Hand,
 Gong Bells, &c.
 Bell Metal Kettles.

SUPPLIES

FOR

Railways, Machinists and Amateurs,
 Gum and Leather Belting, Packings and Cotton
 Waste, Rabbit Metal.

FINE TOOLS

for Machinists and Amateurs; Barnes' Foot Power
 Scroll Saw; Foot Lathes all kinds. Sole Agents
 Baxter Steam Engine, Iron and Wood Working
 Machinery. Send for Price Lists.

JACKSON & TYLER,

16 German St., Baltimore, Md.

HENRY DISSTON & SONS, Keystone Saw, Tool, Steel and File Works,

FRONT AND LAUREL STREETS, PHILADELPHIA.

Branch Works, Tacony, Philadelphia.

Branch House, Randolph & Market Streets, Chicago, Ill.

Our Celebrated CROSS-CUT AND WOOD SAWS.

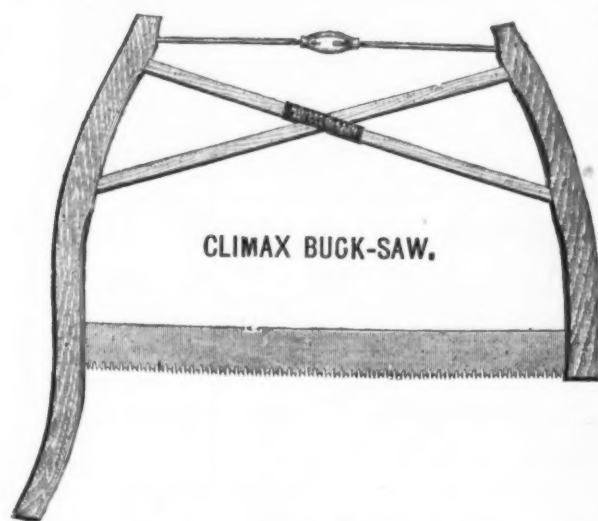
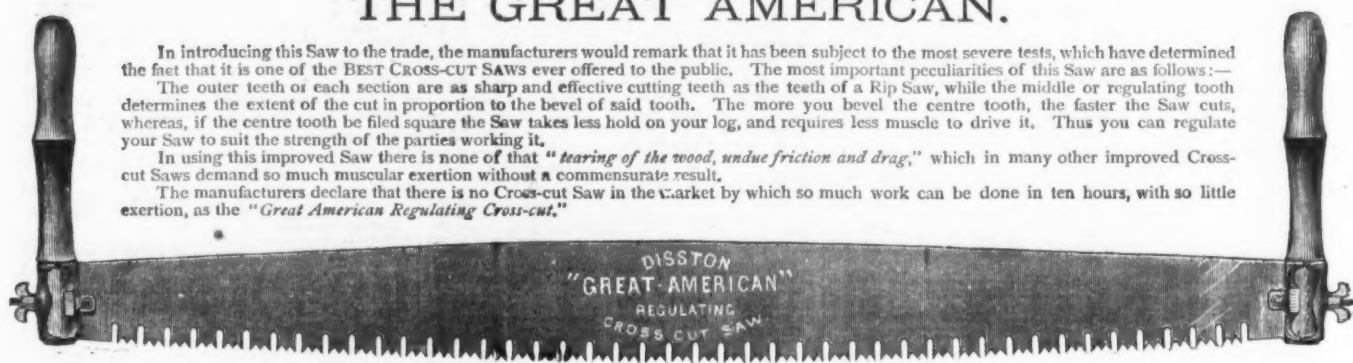
THE GREAT AMERICAN.

In introducing this Saw to the trade, the manufacturers would remark that it has been subject to the most severe tests, which have determined the fact that it is one of the BEST CROSS-CUT SAWS ever offered to the public. The most important peculiarities of this Saw are as follows:—

The outer teeth of each section are as sharp and effective cutting teeth as the teeth of a Rip Saw, while the middle or regulating tooth determines the extent of the cut in proportion to the bevel of said tooth. The more you bevel the centre tooth, the faster the Saw cuts, whereas, if the centre tooth be filed square the Saw takes less hold on your log, and requires less muscle to drive it. Thus you can regulate your Saw to suit the strength of the parties working it.

In using this improved Saw there is none of that "tearing of the wood, undue friction and drag," which in many other improved Cross-cut Saws demand so much muscular exertion without a commensurate result.

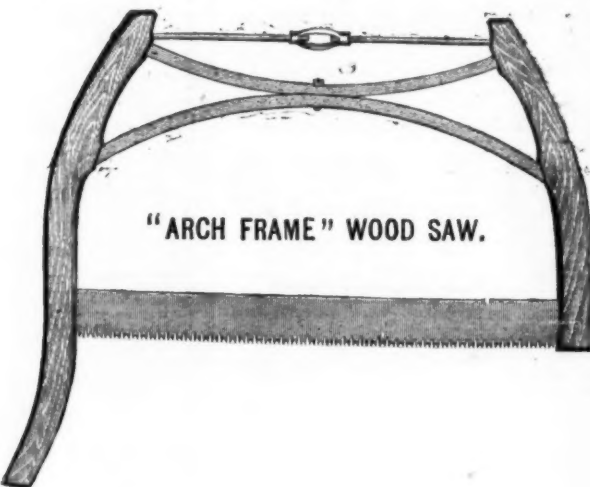
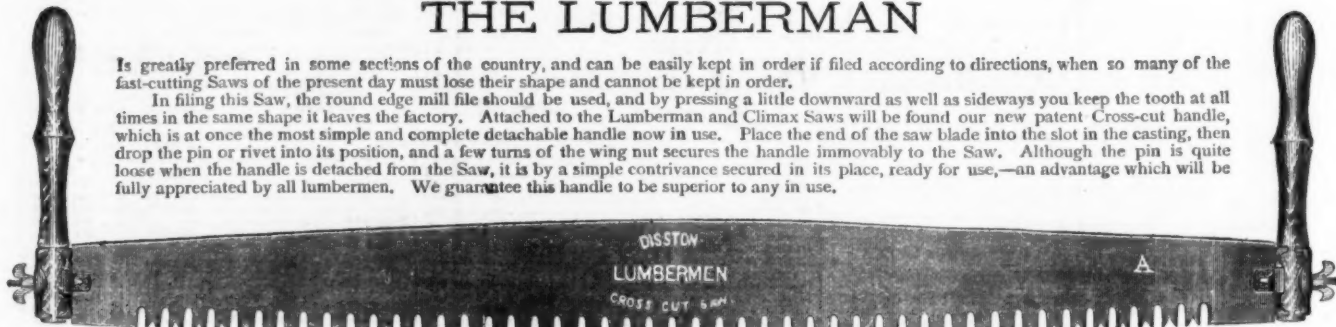
The manufacturers declare that there is no Cross-cut Saw in the market by which so much work can be done in ten hours, with so little exertion, as the "Great American Regulating Cross-cut."



THE LUMBERMAN

Is greatly preferred in some sections of the country, and can be easily kept in order if filed according to directions, when so many of the fast-cutting Saws of the present day must lose their shape and cannot be kept in order.

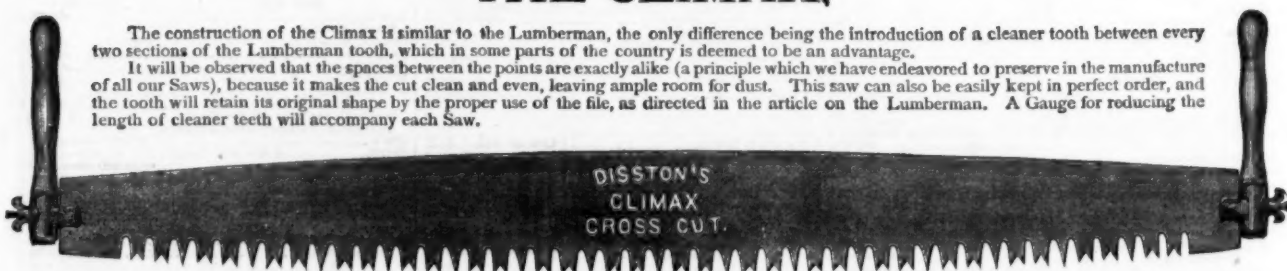
In filing this Saw, the round edge mill file should be used, and by pressing a little downward as well as sideways you keep the tooth at all times in the same shape it leaves the factory. Attached to the Lumberman and Climax Saws will be found our new patent Cross-cut handle, which is at once the most simple and complete detachable handle now in use. Place the end of the saw blade into the slot in the casting, then drop the pin or rivet into its position, and a few turns of the wing nut secures the handle immovably to the Saw. Although the pin is quite loose when the handle is detached from the Saw, it is by a simple contrivance secured in its place, ready for use,—an advantage which will be fully appreciated by all lumbermen. We guarantee this handle to be superior to any in use.



THE CLIMAX.

The construction of the Climax is similar to the Lumberman, the only difference being the introduction of a cleaner tooth between every two sections of the Lumberman tooth, which in some parts of the country is deemed to be an advantage.

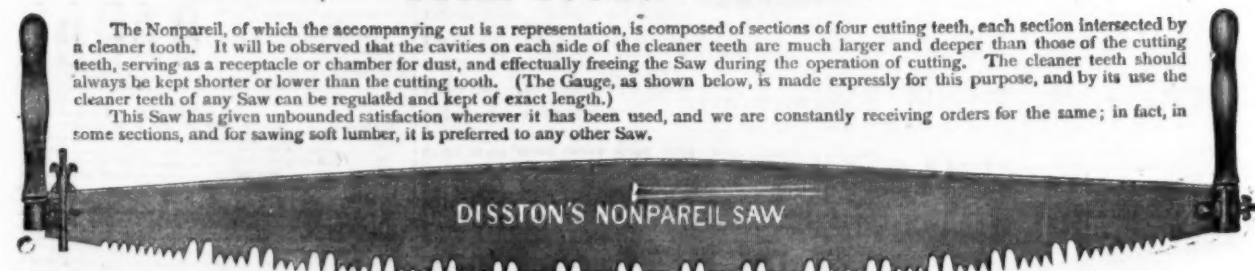
It will be observed that the spaces between the points are exactly alike (a principle which we have endeavored to preserve in the manufacture of all our Saws), because it makes the cut clean and even, leaving ample room for dust. This saw can also be easily kept in perfect order, and the tooth will retain its original shape by the proper use of the file, as directed in the article on the Lumberman. A Gauge for reducing the length of cleaner teeth will accompany each Saw.



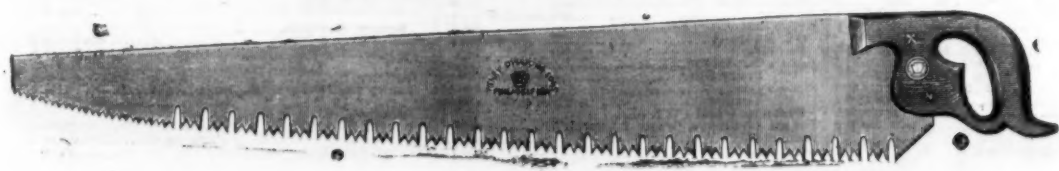
THE NONPAREIL.

The Nonpareil, of which the accompanying cut is a representation, is composed of sections of four cutting teeth, each section intersected by a cleaner tooth. It will be observed that the cavities on each side of the cleaner teeth are much larger and deeper than those of the cutting teeth, serving as a receptacle or chamber for dust, and effectually freeing the Saw during the operation of cutting. The cleaner teeth should always be kept shorter or lower than the cutting tooth. (The Gauge, as shown below, is made expressly for this purpose, and by its use the cleaner teeth of any Saw can be regulated and kept of exact length.)

This Saw has given unbounded satisfaction wherever it has been used, and we are constantly receiving orders for the same; in fact, in some sections, and for sawing soft lumber, it is preferred to any other Saw.



ONE MAN CROSS-CUT.



New York Wholesale Prices, June 20, 1877.

HARDWARE.

[illegible][illegible]

Wellington 100 Lbs. Grain.....	\$2 00 to \$2 10	net
Flour.....	\$2 00 to \$2 10	net
Enamelled and Tinned Ware.		
Kettles.....	do 30 to 35	
Boilers.....	do 30 to 35	
Glue Kettles.....	do 30 to 35	
Tinned Saucepans.....	do 30 to 35	
Doors & Lathes.		
Door Lock.....	Same discounts as Door Locks	
Brass Thread.....	do 00 to 10	
Wood (French).....	do 25 to 30	
Faucets.		
Fenn's.....	do 50 to 55	
Cork Stops.....	do 45 to 50	
Star.....	do 45 to 50	
Pratt's Patent Petroleum.....	do 20 to 25	
Wood and Metallic.....	do 45 to 50	
Brass.....	do 45 to 50	
Enterprise Mfg. Co., Self-Measuring.....	do 20 to 25	
Felted Plates. \$ 50 to \$ 100..... do 40 to 50		
Files.		
Academy File Co.....	\$5 00 to \$ 100	do 40 to 50
Academy File Works.....	\$5 00 to \$ 100	do 40 to 50
Auburn File Works.....	\$5 00 to \$ 100	do 40 to 50
Heller & Bro.....	\$1 50 to \$ 100	do 40 to 50
Hiscox File Mfg. Co.....	\$5 00 to \$ 100	do 40 to 50
Mauden & Cockney File.....	\$5 00 to \$ 100	do 40 to 50
Jowett's.....	do 40 to 50	
Stube.....	do 40 to 50	
Butcher's.....	do 40 to 50	
Flaser.....	do 40 to 50	
Moss & Gamble.....	do 40 to 50	
Blond & Turner Co.....	do 40 to 50	
H. Hinton & Sons.....	do 40 to 50	
Borton's Cant.....	do 40 to 50	
Fluting Machines.		
Mrs. Conner.....	do 40 to 50	
No. 1.....	do 40 to 50	
No. 2.....	do 40 to 50	
No. 3.....	do 40 to 50	
No. 4.....	do 40 to 50	
No. 5.....	do 40 to 50	
No. 6.....	do 40 to 50	
No. 7.....	do 40 to 50	
No. 8.....	do 40 to 50	
No. 9.....	do 40 to 50	
No. 10.....	do 40 to 50	
No. 11.....	do 40 to 50	
No. 12.....	do 40 to 50	
No. 13.....	do 40 to 50	
No. 14.....	do 40 to 50	
No. 15.....	do 40 to 50	
No. 16.....	do 40 to 50	
No. 17.....	do 40 to 50	
No. 18.....	do 40 to 50	
No. 19.....	do 40 to 50	
No. 20.....	do 40 to 50	
No. 21.....	do 40 to 50	
No. 22.....	do 40 to 50	
No. 23.....	do 40 to 50	
No. 24.....	do 40 to 50	
No. 25.....	do 40 to 50	
No. 26.....	do 40 to 50	
No. 27.....	do 40 to 50	
No. 28.....	do 40 to 50	
No. 29.....	do 40 to 50	
No. 30.....	do 40 to 50	
No. 31.....	do 40 to 50	
No. 32.....	do 40 to 50	
No. 33.....	do 40 to 50	
No. 34.....	do 40 to 50	
No. 35.....	do 40 to 50	
No. 36.....	do 40 to 50	
No. 37.....	do 40 to 50	
No. 38.....	do 40 to 50	
No. 39.....	do 40 to 50	
No. 40.....	do 40 to 50	
No. 41.....	do 40 to 50	
No. 42.....	do 40 to 50	
No. 43.....	do 40 to 50	
No. 44.....	do 40 to 50	
No. 45.....	do 40 to 50	
No. 46.....	do 40 to 50	
No. 47.....	do 40 to 50	
No. 48.....	do 40 to 50	
No. 49.....	do 40 to 50	
No. 50.....	do 40 to 50	
No. 51.....	do 40 to 50	
No. 52.....	do 40 to 50	
No. 53.....	do 40 to 50	
No. 54.....	do 40 to 50	
No. 55.....	do 40 to 50	
No. 56.....	do 40 to 50	
No. 57.....	do 40 to 50	
No. 58.....	do 40 to 50	
No. 59.....	do 40 to 50	
No. 60.....	do 40 to 50	
No. 61.....	do 40 to 50	
No. 62.....	do 40 to 50	
No. 63.....	do 40 to 50	
No. 64.....	do 40 to 50	
No. 65.....	do 40 to 50	
No. 66.....	do 40 to 50	
No. 67.....	do 40 to 50	
No. 68.....	do 40 to 50	
No. 69.....	do 40 to 50	
No. 70.....	do 40 to 50	
No. 71.....	do 40 to 50	
No. 72.....	do 40 to 50	
No. 73.....	do 40 to 50	
No. 74.....	do 40 to 50	
No. 75.....	do 40 to 50	
No. 76.....	do 40 to 50	
No. 77.....	do 40 to 50	
No. 78.....	do 40 to 50	
No. 79.....	do 40 to 50	
No. 80.....	do 40 to 50	
No. 81.....	do 40 to 50	
No. 82.....	do 40 to 50	
No. 83.....	do 40 to 50	
No. 84.....	do 40 to 50	
No. 85.....	do 40 to 50	
No. 86.....	do 40 to 50	
No. 87.....	do 40 to 50	
No. 88.....	do 40 to 50	
No. 89.....	do 40 to 50	
No. 90.....	do 40 to 50	
No. 91.....	do 40 to 50	
No. 92.....	do 40 to 50	
No. 93.....	do 40 to 50	
No. 94.....	do 40 to 50	
No. 95.....	do 40 to 50	
No. 96.....	do 40 to 50	
No. 97.....	do 40 to 50	
No. 98.....	do 40 to 50	
No. 99.....	do 40 to 50	
No. 100.....	do 40 to 50	
Forges.		
Emery W. P. Kellogg & Co.....	do 30 to 35	
Keystone Portable Forge Co.....	do 30 to 35	
Forks.		
Haystack & Spading.....	do 35 to 40	
Flaten A L.....	do 40 to 45	
" Reed & Barton.....	do 40 to 45	
Fruit and Jelly Presses.		
Emery W. P. Kellogg & Co.....	do 30 to 35	
Fry Pans.		
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to 35	
Emery W. P. Kellogg & Co.....	do 30 to	

[illegible][illegible]

Chair, " " Block, 90

Dryer, Patent, Am'n, 90

Glass, White, English, 11c; 90

Flocks, 50c

Prostings, 50c

" Sheet, 50c

Glasses' Points, Zinc, 90

Gum, Copal, 25

" Damar, 45

" Balsic, English, 45

" " dark, 40c

Litarge, 40c

Paints, Stone, selected Lamps, 90

Powdered, 3c

Pottery in bladders, 3c

" in bulk, 4c

Rotten Stone, soft, English, 4c

Spirits Turpentine, 25

Whiting, Spanish, 25

Glass.

FRENCH WINDOW GLASS.

Prices current per box of 50 feet.

Single Thick—Discount 60 %.

PIECES.	1st.	2d.	3d.	4th.
6 x 8 to 10 x 15.....	\$ 7.50	\$ 6.25	\$ 6.25	5.75
6 x 10 to 16 x 24.....	8.50	7.75	7.25	6.50
12 x 22 to 20 x 30.....	10.75	9.75	8.75	7.75
15 x 36 to 24 x 30.....	12.25	10.75	9.00	8.00
18 x 42 to 24 x 36.....	13.00	11.50	9.75	8.50
20 x 36 to 36 x 44.....	14.00	12.50	10.75	9.50
26 x 46 to 36 x 50.....	15.00	14.00	11.25	10.00
30 x 52 to 36 x 54.....	16.00	14.50	12.00	10.50
36 x 50 to 36 x 60.....	17.25	15.50	13.00	11.50
36 x 58 to 36 x 60.....	18.25	17.25	15.00	13.50
36 x 50 to 40 x 60.....	20.75	18.75	17.25	15.75

Double Thick—Discount 60 & 10 %.

PIECES.	1st.	2d.	3d.	4th.
6 x 8 to 10 x 15.....	\$12.00	\$11.00	\$10.00	\$ 9.25
11 x 14 to 16 x 24.....	13.75	12.50	11.75	10.75
18 x 22 to 20 x 30.....	17.25	15.75	14.00	12.50
15 x 30 to 24 x 30.....	19.75	17.25	14.50	13.00
20 x 36 to 36 x 44.....	21.00	18.50	15.75	14.25
26 x 36 to 36 x 44.....	23.25	21.25	17.25	15.75
26 x 46 to 36 x 50.....	24.00	22.50	18.00	16.50
30 x 52 to 36 x 54.....	26.75	25.25	19.75	18.25
30 x 52 to 36 x 54.....	27.25	25.00	21.75	19.75
36 x 50 to 36 x 60.....	29.25	27.75	24.00	22.50
36 x 50 to 40 x 60.....	32.25	30.00	26.75	25.00

Sizes above 40 x 60—10.00 per box extra for every five inches.

An additional 10 per cent. will be charged for all Glass more than 40 inches wide. All sizes above 32 inches in length, and not making more than 81 united inches, will be charged in the 81 united inches bracket.

T & CO.,

Merchants, Buffalo, N. Y.

PURERS OF

POST HOLE AUGER.

Durable, and the handiest Earth Auger in Market, for three holes while any other auger is boring. Works readily in clay, sand, gravel, or muck soil, runs in rods without the use of shovel or spade to clear out.

For use are easily broken, bent and disabled, strong pressure. The "Fletcher" Auger will be a peculiar construction enables it to cut by the such a manner as to push itself speedily and

is drawn from the hole; it brings all the dirt emptied. *Strongly made, simple and handy* manner of cutting. Always ready for use.

Market, and we offer to the trade a liberal discount..... Retail price, net, \$3.50 each.

each. Less 20 per cent.

CO., New York Agents.

IED 1836.

R STEEL

WIRE

Market Rates.

ARD & CO.,

, N. Y.

ERS OF THE

ping Works.

IDGE & CO.,

et, New York.

chen Ice Tongs

MADE FROM

est Refined Bar Iron.

POINTS CASE HARDENED.

..... \$2.25 per dozen.

..... 2.75 "

..... 3.00 "

CLTON

indow Screen

Wire Cloth.

Steel.

SULZBACHER, HYMAN, WOLFF & CO.,

IMPORTERS OF

IRON AND STEEL.

Sole Agents for the Sale of the Celebrated
Pr. HOMOGENEOUS DEC.' CAST STEEL, GUN BAR-
RELS, MOULDS AND ORDNANCE.
Sole Agents for **COCKER BROTHERS, Limited.**

Successors to
SAML. COCKER & SON, (ESTABLISHED 1752.)
SHEFFIELD, ENGLAND.

Sole manufacturers of
"SC" **EXTRA" Cast Steel,**
AND
CAST STEEL WIRE FOR ALL PURPOSES.
Sole makers of COCKER'S "METEOR" WIRE PLATES.
Railroad Supplies and General Merchants.
Office and Warehouse, 46 Cliff Street, New York.

F. W. MOSS,
Successor to JOSHUA MOSS & GAMBLE BROS.
FRANKLIN WORKS, WALKLEY WORKS, SHEFFIELD, ENGLAND.
STEEL AND FILES.
Principal Depots: 80 John St., N. Y., and 512 Commerce St., Phila.
MOSS & GAMBLE SUPERIOR C. S. "FULL WEIGHT" FILES,
Cast Steel Hammers and Sledges. Also, "M. & G." Anvils and Vises.
WARRANTED CAST STEEL, especially adapted for DIES and TURN-
ING TOOLS, DRILLS, COLD CHISELS,
PUNCHES and all kinds of MACHINISTS' TOOLS.
Celebrated Improved Mild Centre Cast Steel, for Taps, Reamers, and Milling Tools,
warranted not to crack in hardening Taps of any size.
Swede Spring Steel, especially adapted to Locomotive and Railway Car Springs.
English Spring and Plow Plate Steel.
Sheet Cast Steel Shear, German, Round Machinery, Hammer, Fork and Shovel Steel
GENERAL MERCHANT.

Isaac Jenks & Sons,
MINERVA AND BEAVER WORKS, WOLVERHAMPTON, ENGLAND.
MANUFACTURERS OF
"JENKS" SPRING STEEL, "MINERVA" SWEDEN, AND "ANGLO" CAST SPRING STEEL.
"JENKS" TIRE, TON CORK, SLEIGH SHOE, BLISTER, AND FLOW STEEL;
ALSO,
"BEAVER" FLOW, TIRE, AXE, AND SHEET IRON.
ISAAC JENKS, Jr., Representative, 245 Pearl and 20 Cliff Streets, N. Y.

FRANCIS HOBSON & SON,
97 John Street, NEW YORK,
Sole Manufact'rs of **"CHOICE" Extra Cast Steel.**
Manufacturers of all Descriptions of Steel.
Manufacturers of Every Kind of Steel Wire.
Don Works, Sheffield, England.
CHAS. HUGILL, Agent.

S. & C. WARDLOW,
Sheffield, England,
Manufacturers of the Celebrated
Cast and Double Shear
STEEL.
In Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Table Knives,
Turning Tools, Dies, Files, Clock and other Springs, and Tools of every variety.
Warehouse, 95 John Street, New York.
WILLIAM BROWN, Representative.

Established 1810.
J. & RILEY CARR,
SHEFFIELD, ENGLAND.
Manufacturers of the "Celebrated"
"DOG BRAND" FILES.
Also of Superior
STEEL
For Drills, Cold Chisels, Tools, Taps, Dies, &c.
COLD ROLLED STEEL for Clock Springs, Corsets, &c.
SHEET CAST STEEL for Springs, Saws, Welding and Stamping Cold, &c.
GERMAN, MACHINERY, ENGLISH AND SWEDEN SPRING STEEL,
And all other descriptions for machinists and agricultural purposes.
Warehouse, 30 Gold Street, New York.
(Near John Street.) HENRY MOORE, Agent.



Steel.

SANDERSON BROS. STEEL COMPANY,

GEDDES WORKS, Syracuse, N. Y.

Manufacturers of the Celebrated
SANDERSON BROTHERS & CO.'S
CAST STEEL,
Warranted most SUPERIOR and UNSURPASSED for
TOOLS and GRANITE ROCK DRILLS.
EDWARD FRITH, Treasurer, 16 Cliff St., New York.
WILLIAM A. SWEET, General Manager, Syracuse, N. Y.
A full assortment of this universally approved OLD BRAND of English Steel
For Sale at
16 Cliff Street, NEW YORK.

SWEET'S MANUFACTURING COMPANY

SYRACUSE, N. Y.

Manufacturers of "SWEET'S" celebrated
STEEL GOODS.
Sweet's Excelsior Tire Steel. Sweet's Oil Tempered Black Seat Springs.
BENT AND TWISTED
TRADE MARK.
COLD
SLEIGH SHOE STEEL. CALKING STEEL. STEEL CUTTER SHOES.
MACHINERY STEEL. KNIFE BACK STEEL. "HARROW TEETH."
SPRING STEEL. STEEL CROW BARS. "TOB CALKS."
AND ALL KINDS OF ROLLED AND HAMMERED STEEL.
W. A. SWEET, President. J. M. SCHERMERHORN, Jr., Treasurer. FRED. B. CHAPMAN, Secretary.

LABELLE STEEL WORKS.
SMITH, SUTTON & CO.,
MANUFACTURERS OF ALL KINDS OF
STEEL.
Also, Springs, Axles, Rake Teeth, &c.
OFFICE & WORKS, Ridge, Lighthill & Belmont Sts., & Ohio River, Allegheny.
Post Office Address, Pittsburgh, Pa.

MIDVALE STEEL WORKS.
Works and Office, NICETOWN, PHILADELPHIA, PA.
MANUFACTURERS OF
CRUCIBLE AND OPEN HEARTH STEEL,
Steel Locomotive Tires. Steel Axles of every description.
STEEL FORGINGS UP TO 8000 lbs. IN WEIGHT.
Solid Steel Castings, Hammer Dies, Frogs, Crossings, etc.
BEST TOOL, MACHINERY AND SPRING STEELS.
WM. SELLERS, Pres. CHAS. A. BRINLEY, Supt. MARRIOTT C. SMYTH, Sec. & Treas.

Pyrolusite Manganese Co.,
MINERS, DEALERS AND EXPORTERS OF HIGH TEST,
Crystallized Black and Gray Oxides of
MANGANESE.
Ground, granulated and especially prepared to suit all branches of the home trade.
Warranted to contain from 70 to 90 per cent. peroxide of manganese, and to give satisfaction with re-
gard to price and quality.
ALSO, MANUFACTURERS OF SUPERFINE FLOATED

Standard Barvtes.
Office, 214 Pearl Street, New York
MILLER, METCALF & PARKIN,
Crescent Steel Works,
PITTSBURGH, PA.,
Manufacturers of all Descriptions of
STEEL,
EQUAL TO ANY IN THE MARKET.
Office, 339 Liberty Street, PITTSBURGH, PA.

JONAS, MEYER & COLVER,
CONTINENTAL STEEL WORKS, SHEFFIELD, ENGLAND.
ATTERCLIFFE,
Manufacturers of
EXTRA BEST WARRANTED CAST STEEL,
For all Descriptions of Fine Tools.
J. M. & C. Manufacture Tool Steel exclusively.
M. DIAMOND & CO., Principal Agents for the United States and Canada.
Office and Warehouse, No. 6 Ford Street, HARTFORD, CONN.

D. G. GAUTIER & CO.,
MANUFACTURERS OF
Hammered and Rolled STEEL of every description
JERSEY CITY, NEW JERSEY.
DUDLEY G. GAUTIER. JOSEPH H. GAUTIER.

Steel.

R. MUSHET'S

Special Steel
FOR
LATHES, PLANERS, &c.

Turns out at least double work by increased speed
and feed, and cuts harder metals than any other
Steel. Neither hardening nor tempering required.
Sole Makers
SAMUEL OSBORN & CO.,
Sheffield, England.
Represented by
RANDALL & JONES, 10 Oliver St., Boston.
BRANCH, CROOKES & CO., Vine Street, St. Louis, Mo.

Gunpowder.
GUNPOWDER
DUPONT'S
Sporting, Shipping, and Mining
POWDER.
DUPONT'S GUNPOWDER MILLS,
ESTABLISHED IN 1801,
Have maintained their great reputation for 75
years. Manufacture the
Celebrated Eagle Ducking,
Eagle Rifle, & Diamond
Grain Powder.
THE MOST POPULAR POWDER IN USE.
Also, SPORTING, MINING, SHIPPING, AND BLAST-
ING POWDER.
of all kinds and descriptions.
For sale in all parts of the country. Represent-
ed by

F. L. KNEELAND
70 Wall Street, NEW YORK.
GUN POWDER.
Lafin & Rand Powder Co.,
No. 26 Murray Street, New York,
Manufacture and sell the following celebrated brands
of Sporting Powder known everywhere as
ORANGE LIGHTNING,
ORANGE DUCKING,
ORANGE RIFLE,
more popular than any Powder now in use.
Blasting Powder and Electrical Blasting
Apparatus.
Military Powder on hand and made to order.
SAFETY FUSE, FRICTIONAL & PLATINUM
FUSES.
Pamphlets showing sizes of grain sent free.

WM. ESTERBROOK
Wholesale Manufacturer of
Coal Hods,
FIRE SHOVELS, Etc.
311 Cherry St., PHILADELPHIA.

FISHER'S MOWING MACHINE
KNIFE GRINDER,
SICKLE EDGE HAY KNIVES, HAY FORKS, SEC-
TIONS, &c., &c.
Sold by Hardware and Implement Dealers
everywhere. Illustrated Circular and
Quotations sent free.
HENRY FISHER, Canton, Ohio.

DAVIS PATENT HYDRANT.
Patented May 8, 1876. Readily repaired without the necessity of dis-
assembling the hydrant. The hydrant is made of cast iron and is
guaranteed to make it non-rusting and non-freezing. Now in practical
use in Washington, D. C., and by the Water Department, D. C.
STATE RIGHTS FOR SALE.
Address No. 1219 Eleventh Street, NEW YORK, N. Y.
W. H. DOUGLASS, 1209 D St., N. W., Washington, D. C.,
Manufacturer of all kinds of
Plumbing, Steam and Gas Fitting Materials.

HIGHEST MEDAL AWARDED.
A. L. JONES
PATENT IMPROVED STEAM TRAP.
The only self-regulating Steam Trap in the world.
For full description send for circular to
A. L. JONES,
Steam Heating Establishment, 51 S.
4th Street, Philadelphia.



Steel.

THE EDGAR THOMSON STEEL CO., LIMITED.

MANUFACTURERS OF



General Office and Works at Bessemer Station (Penn. R. R.), Allegheny County, Pa.

New York Office, 57 Broadway.

The members of the Edgar Thomson Steel Company, Limited, have had large experience in manufacturing and in railway management; their works are the most complete in the world, with all the late improvements, and are located in the best Bessemer metal district in the United States, and their managing officers are experienced in the manufacture of Bessemer Steel.

The Company warrants its rails equal in quality to any manufactured in the United States. Rails of any weight or section furnished on short notice. Orders for trial lots solicited.

Branch Office and P. O. Address, No. 41 Fifth Ave., Pittsburgh, Pa.
D. McCANDLESS, Chairman. W. P. SHINN, General Manager.

G. SANDERSON & CO.,

Manufacturers of all descriptions of

STEEL.

SHEFFIELD, ENGLAND.

Particular attention is paid to quality and temper for

Files, Saws, Table and Pocket Cutlery, Augers, Shovels, &c.

Also STEEL of superior quality for Turning Tools, Taps, Dies, Drills, &c.
Hot and Cold Rolled Sheets for Clock Springs, Corset Clamps, Pens, &c.

Makers of the Celebrated ROCK BORING DRILL STEEL.

Warehouse, 102 John Street, New York.

JOHN NICHOLSON & SONS,

Sheffield, England.

Manufacturers of SUPERIOR

STEEL

Of all Descriptions.

F. A. HOWARD,

Sole Agent for the United States.

81 John Street, New York.

38 Kilby Street, Boston.

CHROME STEEL COMPANY,

MANUFACTURERS OF

CHROME CAST STEEL,

WARRANTED SUPERIOR TO ANY STEEL IN THE MARKET—EITHER ENGLISH OR AMERICAN—FOR EVERY PURPOSE.

Principal Office & Works, Kent Ave. and Keep St., Brooklyn, E. D. N. Y.

AGENCIES,

Kimber Bros. & Co., Chicago, Ill.
Patterson, Hopkins & Co., San Francisco and
Sacramento, Cal.
M. H. Buck & Co., St. Louis, Mo.
Potter & Hoffman, Philadelphia, Pa.
Geo. Dunbar & Co., Boston, Mass.
Wood & Leggat, Hamilton, Ont.
Cincinnati Branch, 123 Central Ave., George Kinsey, Manager.

ALBANY & RENSSLAER IRON & STEEL CO.,

Troy, N. Y.,

Office in New York City, 56 BROADWAY.

MANUFACTURERS OF

Bessemer Railway Steel,

MERCHANT BARS, TIRE AND SHAFING.

Railroad Iron, Pig Iron, Merchant and Ship Iron.

AGENCIES IN BOSTON AND PHILADELPHIA.

JOHN WILSON'S CELEBRATED

BUTCHERS' KNIVES,

BUTCHERS' STEELS,

AND
SHOE KNIVES.

THE TRADE MARK, IN ADDITION

TO THE NAME,

IS STAMPED UPON EVERY ARTICLE MANUFACTURED BY

JOHN WILSON.

BUYERS ARE SPECIALLY CAUTIONED AGAINST
IMITATIONS OF THE MARK, AND THE
SUBSTITUTION OF COUNTERFEITS
BEARING THE NAME, "WILSON," ONLY.

GRANTED A.D. 1786, BY THE
CORPORATION OF CUTLERS OF SHEFFIELD,
AND PROTECTED BY ACT OF PARLIAMENT.

Works:—SYCAMORE STREET, SHEFFIELD. ESTABLISHED in the Year 1750.

HERMANN BOKER & CO.,

OFFICES AND WAREHOUSES:

NEW YORK, 101 and 103 Duane and 91 and 93 Thomas Streets.

RENSSELAER and SOLINGEN (Prussia.) H. BOKER & CO.

SHEFFIELD (England), No. 3 Arundel Lane, Represented by Mr. ARTHUR LEE.

LIEGE (Belgium), Represented by Mr. LOUIS MULLER.

Manufacturers and Importers of Cutlery, Guns, Hardware and Railroad Material.
Proprietors of TRENTON VISE and TOOL WORKS, Trenton, N. J.—Vises, Picks,
Mattocks, Grab Hoes, Sledges, Hammers, Bridge Work, Turn Tables, etc.

Proprietors of the MANHATTAN CUTLERY CO., "O. K." Razors.

LAMSON & GOODNOW MFG. CO., Shelburne Falls, Mass.—Table Cutlery and Butcher

Knives.

W. & S. Butcher's Files, Edge Tools and Razors, the largest stock in the United States.

Geo. Westenhelm & Son's Knives, Scissors and Razors, the largest stock in the U. S.

John Wilson's Butcher and Shoe Knives.

Peter Wright's and Armitage Anvils.

We always have on hand a full assortment of

German and English Hardware, Cutlery, Guns, Gun Material,

Chains, Heavy Goods.

Business Established in 1830.



BLAKE BROS. Hardware Co.,

MANUFACTURERS OF

Plain and Ornamental Butts, Thumb Latches,

STORE DOOR HANDLES,

Single or Double Handle, Reversible Mortise Latch,

Patented January 9, 1877.

Oilable Axle Pulleys,

Patented October 10, 1876.

KEY ESCUTCHEONS that keep the Key in the Lock,

Patented February 2, 1875.

CORK EXTRACTORS, NUT CRACKERS,

And a large line of

BUILDERS' HARDWARE.

OFFICE, 85 Orange Street, New Haven, Ct.

FACTORIES, Westville, Ct.

AGENCIES:

Geo. H. Gray & Danforth, 48 India St., Boston, Mass.

Wm. A. Dodge, 96 Chambers Street, New York.

S. T. Latham & Co., 417 Commerce Street, Philadelphia, Pa.

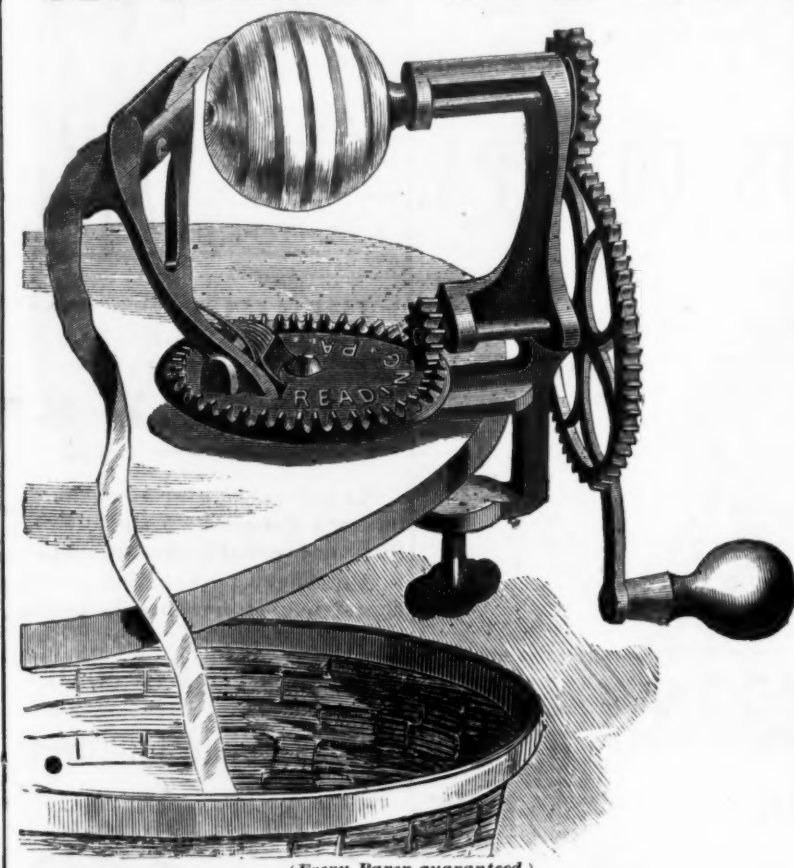
Focke & Co., 12 German Street, Baltimore, Md.



READING BUTT WORKS.

RICK BROTHERS.

"OLD RELIABLE" APPLE PARER.



(Every Parer guaranteed.)

Price, per single dozen \$5'00.

Packed one dozen in a box.

New York Warerooms, 103 Chambers Street.

E. E. YATES & CO., Agents.

NORTHWESTERN

HORSE NAIL CO.

ESTABLISHED IN 1862.

HAMMERED AND FINISHED HORSE NAILS.

We offer our Finished Nail to the trade with the
confidence that it has no equal in the market. It is the
genuine "Northwestern" Nail, Finished, and we give it our
unqualified guaranty.

Office and Factory, 56 to 68 Van Buren st., Chicago.

A. W. KINGSLAND, Secretary.

GLOBE NAIL COMPANY,

MANUFACTURERS OF

Pointed Polished & Finished Horse Shoe Nails.

Recommended by over 20,000 Horse Shoers.

All nails made from best NORWAY IRON, and warranted perfect and
ready for driving. Orders filled promptly and at lowest rates by

GLOBE NAIL CO., Boston, Mass.

THE FOWLER NAIL CO.,

SEYMOUR, CONN., Manufacturers of

THE VULCAN HORSE SHOE NAIL

POINTED READY FOR DRIVING.

Emerg. Grindstones, &c.

Walter R. Wood, GRINDSTONES.

SOLE AGENT OF THE

BEREA STONE CO., of Ohio,
NOVA SCOTIA and other brands.

283 & 285 Front Street, New York.

WORTHINGTON & SONS,

North Amherst, Ohio.

Manufacturers of

Lake Huron Amherst
and Berea

GRINDSTONES.

A. F. PIKE,

East Haverhill, New Hampshire,

Manufacturer and Wholesale Dealer in

Scythe, Axe, Knife and Hacks

STONES.



LETOILE,

UNION,

PREMIUM,

DIAMOND GRIT,

WHITE MOUNTAIN,

INDIAN POND (red ends)

stones gotten up or labeled in

any style desired. Price and

quality guaranteed.

Our Stone are of good keen

grit and will not glaze.

Steam Oil Stone Works.

F. E. DISHMAN,

Successor to Wm. Galbraith & Co.

Manufacturer of and Dealer in the Best
Washita, Arkansas, Hindostan and Sand

STONES.

17" of various sizes and patterns, suited to every variety of Mechanical use. New Albany, Ind.

Send for price list.

BOYD & CHASE,

The largest manufacture in the world of

OIL STONE

Of all description.

107th Street and Harlem River, NEW YORK.

Send for Price List.

Coal.

A. PARDEE, Hazelton, Pa.

J. G. FELL, Fair!

A. PARDEE & CO

303 Walnut St.,

PHILADELPHIA.

No. 111 Broadway, New York.

MINERS AND SHIPPERS OF

Lehigh Coals.

The following superior and well known Lehigh Coals are mined by ourselves and firms connected with us, viz.

A. Pardee & Co. { HAZLETON,
CRANBERRY,
SUGAR LOAF.

Pardee, Bro. & Co. LATTIMER.

Calvin Pardee & Co. HOLLYWOOD.

Pardee, Sons & Co. Mt. PLEASANT.

ROBERT HARE POWEL & CO.

GENERAL OFFICES:

424 Walnut Street, Philadelphia.

75 Trinity Building, New York.

16 S. Water St., Providence, R. I.

22 Central St., Boston, Mass.

Sole Proprietors, Miners & Shippers of the celebrated

POWELTON SEMI-BITUMINOUS COALS.

THE BEST & CHEAPEST

In the market for the use of Ocean Steamers, Tugs,
Steamboats and Locomotives. Stationary
Engines, Steel Mills, Rolling Mills,
Puddling Furnaces, Glass

Manufacturers,
Blacksmithing, Brick and Lime Burning, and General Industrial Purposes.

These coals can be delivered to all points reached by railroad or navigation.

Lehigh Valley Coal Co.,
MINERS AND SHIPPERS OF

Lehigh, Wyoming White & Red Ash

(BALTIMORE VEIN.)

Office, cor. Cortlandt & Church Sts.

Coal and Iron Exchange Building.

GEORGE H. NEWTON, Agent. Shipments by Rail

road and Morris Canal direct from the mines, and from

Perth Amboy and Jersey City, for all Points.

THE HOBOKEN COAL CO.,

Dealers in

SCRANTON, LEHIGH and other COALS.

Retail Yard on D. L. & W. Railroad, cor. Grove and

19th Sts., Jersey City. Coal delivered direct from Shutes

to Cars and Wagons. Families and manufacturers supplied with the best quality of Coal at the lowest rates.

Office: At Yard cor. Grove and 19th Sts., cor. Bay

St. and Newark Ave., Jersey City; Room 21, 111 Broad-

way, N. Y. Telephone Office, Bank Building, cor. New and

Hudson Sts., Hoboken. P. O. Box 21, Hoboken.

WHEELING HINGE CO.,

Wheeling, West Va.,

Manufacturers of

Wrought Butts, Strap & T Hinges, Wrought Hooks,
Hasps & Staples, Wrought Repair
Links & Washers.

GRAHAM & HAINES, Sole Agents, 113 Chambers & 95 Reade Sts., N. Y.

**QUACKENBUSH, TOWNSEND & CO.,
Hardware, Cutlery, &c.**

85 Chambers & 67 Reade Sts., N. Y.

Depot for
THOS. JOWITT & SONS,
(Sheffield, England.)
FILES and HORSE RASPS.

Rough & Ready
And
CLIPPER SCYTHES,
Warranted.



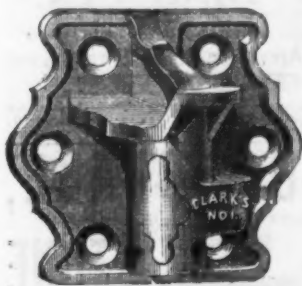
Patented March 4, 1874.

Agents for
Norwich Lock
MFG. CO.

"BEAVER"
American
FILES and HORSE RASPS.
"WIDE AWAKE"
AXES.

CLARK & CO.,

MANUFACTURERS OF

**BUILDERS'
HARDWARE.**

426 & 428 Niagara Streets,
BUFFALO, N. Y.

J. CLARK WILSON & CO., Agents,
81 Beckman St., New York.

Send for Catalogue and Price List.

ENTERPRISE MFG. CO. of PA.

PHILADELPHIA.

AMERICAN
COFFEE,
SPICE,
AND
DRUG
MILLS.
MEASURING
FAUCETS.
"CHAMPION
TOBACCO,"
HERB
AND
ROOT
CUTTERS.
ROTARY
CORK
PRESSERS.

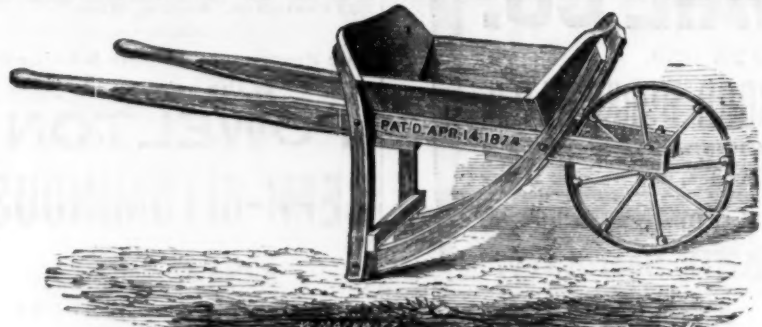


BUNG HOLE
BORERS.
SAUSAGE
STUFFERS.
FRUIT,
LARD
AND
JELLY
PRESSES.
TINCTURE
PRESSES.
SELF-
WEIGHING
CHEESE
KNIVES.
&c., &c., &c.

Mrs. Potts' Cold Handle Sad Irons.

For Sale by the Hardware Trade.

Send for Illustrated Catalogue and Price List.

CHAMPION BARROWS.**WITH WOOD OR IRON WHEELS.**

A first-class article and a specialty, that will make a demand in any market and afford a good margin for dealers. We are prepared to furnish them in large quantities. Manufactured by

BRYAN MANUFACTURING CO., Bryan, O.

SEMPLE & BIRGE MFG. CO., Sole Western Agents, ST. LOUIS, MO.

Bemis & Call Hardware & Tool Co.**PATENT COMBINATION WRENCH.**

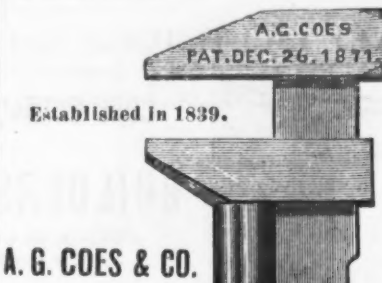
These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, Case-Hardened throughout, and not only combine all of the superior qualities of our cylinder & Gas Pipe Wrenches, but also all requisite combinations of a regular Nut Wrench, thus making a Combination which has no equal.

For Circulars and Price List, address,

BEMIS & CALL HARDWARE & TOOL CO., Springfield, Mass.**METALLIC SIEVES.**

Protected by 14 patents.
MANN'S PATENT.
Best Sieve known, Cheap, Neat and Durable
ADAMS & WESTLAKE MFG. CO.,
CHICAGO, ILLS.

GRANT & CO., Newark, N. J.
Cap Rifles & Targets.



A. G. COES & CO.

WORCESTER,

Mass.

Manufacturers of

THE GENUINE

COES'

SCREW WRENCHES.

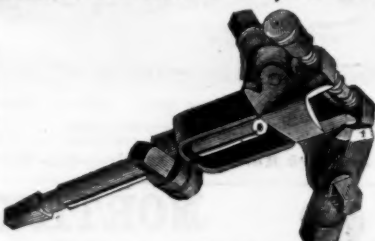
Our goods have been very much improved recently, by making the Bar WIDE, as shown in the cut, which makes a 12 in. Wrench as strong as a 16 in. made in the ordinary way, and by using

A. G. COES' NEW PATENT FERRULE

Which cannot be forced back into the handle.
Our goods are manufactured under Patents dated February 7, 1860, (re-issued June 29, 1871), May 2, 1871, and Dec. 26, 1871, and any violation of either will be rigorously prosecuted.

We call particular attention to our new Patent Ferrule, with its Supporting Nut (shown in section in the above cut), which makes the strongest Ferrule fastening known.

A. G. COES & CO.

Smith's Patent Improved.**THE BEST ADJUSTABLE HOLLOW AUGER MADE.**

E. M. BIRDALL & Co., Pen Yan, N. Y., write:
"The Tension Auger, which you sent us on approval, we have fully and severely tested. It is the best tool for the purpose which we have seen or used."

CHAS. M. GHRISKEY,
Manufacturers' Agent,
508 Commerce Street, Philadelphia, Pa.

GOLD MEDAL

"I Rise to remark."
A PERFECT
MANGLE
FOUND AT LAST.



Baldwin's Steam Mangle.

Hotels, Asylums, Laundries.

Families See Circulars.

COBB & DREW,

Plymouth, Mass.

Manufacturers of Copper, Brass, and Iron Rivets: Common and Swedes Iron, Leathered, Carpet, Lace and Glass Tacks: Finishing, Hungarian, Trunk, Closet and Cigar Box Nails, &c. Rivets made to Order.

NEW YORK AGENCY

George C. Grundy, HARDWARE.

165 Greenwich Street.

Agent for the Philadelphia Star Carriage and Tire Bldg.

**Lloyd, Supplee & Walton,
HARDWARE FACTORS.**

MANUFACTURERS OF

Bonney's Hollow AUGERS.

Stearns' Hollow Augers
and Saw Vises

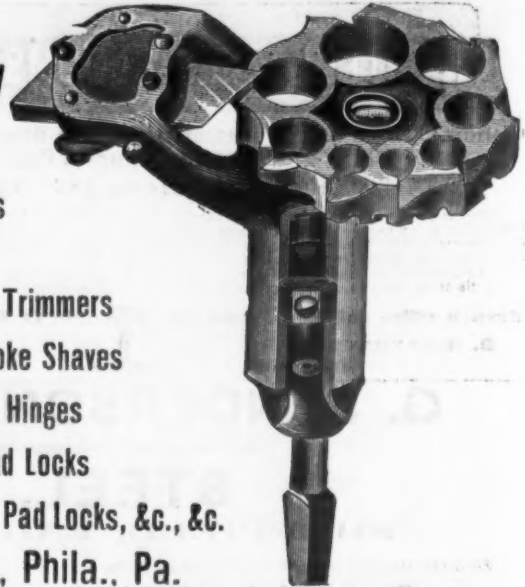
Bonney's Spoke Trimmers

Double Edge Spoke Shaves

Adjustable Gate Hinges

Scandinavian Pad Locks

Flat Key Brass and Iron Pad Locks, &c., &c.
625 Market St., Phila., Pa.

**"FELTER'S PATENT LOCKS,"**

MANUFACTURED BY

The American Lock Mfg. Co.,

Are the most SECURE and DURABLE ever made.

SECURE

Because they have 40 Brass Tamblers, independent in their action, either one of which will prevent the Lock from being opened unless brought to proper position by the Key.

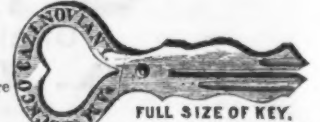
DURABLE

Because we use no Springs to break or get out of place

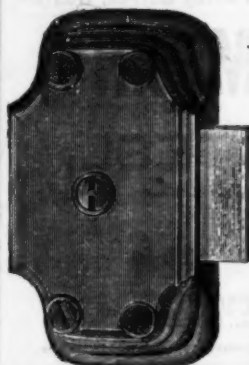
THEY HAVE

STERLING METAL KEYS

That will not corrode or wear, and are stronger than steel.



FULL SIZE OF KEY.



Upright Rim Dead Locks,
Horizontal Rim Night Latches,
Horizontal Rim Tubular Night Latches,
Mortise Night Latches, Plain Fronts,
Mortise Night Latches, Ornamental Bronze Fronts and Knobs,
Brass Chest, Box, Cupboard and Drawer Locks,

Solid Bronze Padlocks.

Illustrated Catalogue and Price List sent on application.

All orders should be addressed to



UNION NUT CO., General Agents, 99 Chambers St., N. Y.

THE IMPROVED**HOWE SCALES**

In Competition with the World, at Philadelphia, 1876

TWO FIRST MEDALS, and TWO DIPLOMAS OF MERIT

The following are the points that the Judges officially announce as the basis of their award of the highest honors to the Howe Scales:

- 1st. For their Protected Bearings (the Howe is the only Scale with protected bearings), which makes the Scale **DURABLY ACCURATE.**
- 2d. For their Strength.
- 3d. For their Simplicity.
- 4th. For their economy in construction.
- 5th. For their first rate material and workmanship.
- 6th. For their various original improvements and adaptations (which being patented are exclusively possessed by the **HOWE**).

The Improved Howe Scales

MADE BY THE

BRANDON MFG. COMPANY, of Brandon, Vt.,

Are Guaranteed Superior to all others.

For Plans, Prices and other information, address,

A. M. GILBERT & CO., 95 to 101 Lake St., Chicago. 116 Main St., Cincinnati. 612 N. Third St., St. Louis.
PAGE & CO., 3 Park Place, New York City. 63 Wood St., Pittsburgh.
I. S. WILLIAMS, 213 Market St., Philadelphia.
PRIEST, PAGE & CO., 145 Franklin St., Boston.
V. S. W. PARKHURST, Cor. Market & Fremont Sts., San Francisco, Cal.
FROTHINGHAM & WORKMAN, Montreal, Canada.

V. G. HUNDLEY.

79 Reade Street, New York.

**North Carolina Handle Co.,**

Manufacturers of

SPOKES, AXE, PICK, SLEDGE, HAMMER, HATCHET and other HANDLES.
Full assortment always on hand.

PATENTED
ST. LOUIS STAMPING CO.,

GRANITE IRON WARE

ST. LOUIS, MO.
MAY 30, 1876.



All Goods Marked
FOR SALE

Granite Iron Ware.
EVERYWHERE.

GRANITE IRON WARE IS THE ONLY SUITABLE HOUSEHOLD WARE MADE.
Represented in New York by the WIEBUSCH & HILGER HARDWARE CO., Nos. 84 and 86 Chambers Street.

**BRADLEY'S
CUSHIONED HELVE HAMMER.**

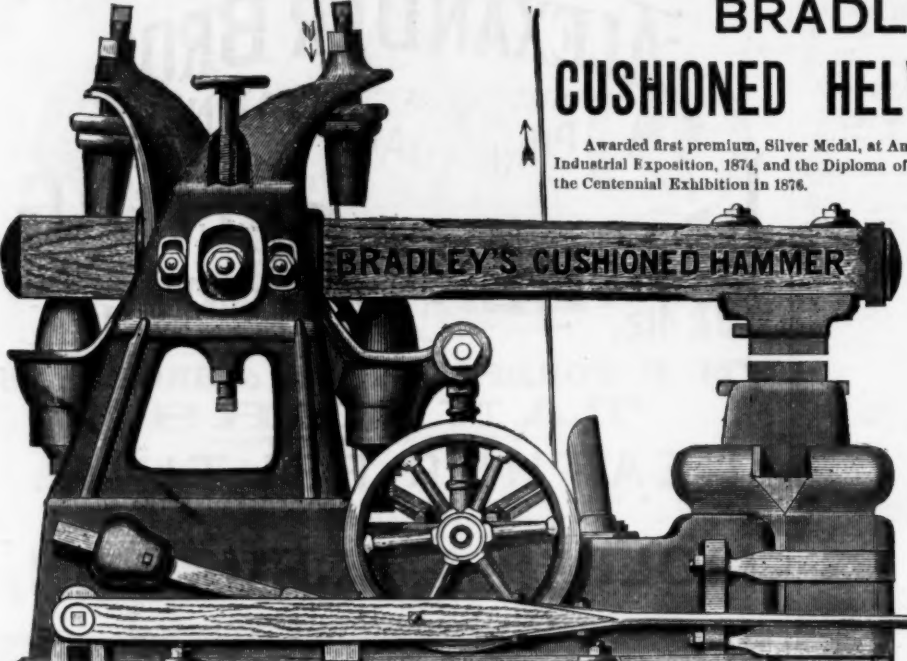
Awarded first premium, Silver Medal, at American Institute Fair, 1873, Cincinnati Industrial Exposition, 1874, and the Diploma of Honor and Grand Medal of Merit at the Centennial Exhibition in 1876.

Being the highest award given any goods of their class in America or Europe.

It has More Good Points,
Less Complication,
More Adaptability,
Larger Capacity,
Does More & Better Work,
Takes Less Power,
Costs Less for Repairs,
than any Hammer in the World.

Guaranteed as Represented.

Bradley Mfg. Co
SYRACUSE, N. Y.
(Established 1832.)
Western Office, 22 S. Canal
St., Chicago, Ill.
A. B. BARNES, Manager.




BLISS & WILLIAMS,
Manufacturers of all kinds of
PRESSES, DIES, & SPECIAL MACHINES,
FOR WORKING SHEET METALS, &c.

167 to 173 Plymouth Street, Cor. of Jay, Brooklyn N. Y.



HOLROYD & CO.,
Waterford, N. Y.



LANE & BODLEY CO.,
HYDRAULIC ELEVATORS

For Stores, Warehouses, Residences and Hotels.

These elevators have advantages over special steam service, in first cost of construction, running expense, convenience, cleanliness and saving of insurance.

We have a large number in operation and they have been fully tested. Satisfactory results guaranteed.

LANE & BODLEY CO.,
John and Water Streets, Cincinnati, O.

DROP FORGINGS
AND
Special Machinery.

Hardware & Tools and Specialties in Metals
manufactured to order.

HULL & WELDEN CO., Danbury, Ct.

Thomas B. Harkins
Bristol, Pa., Manufacturer of

The Ball Tuyere Irons

AND
TIRE BENDERS.
FINE GRAY CASTINGS of all kinds
made to order.

**THE
Green River
TIRE UPSETTER.**
PRICE, \$20.00.

Will upset, stretch and weld equally
well on the lightest Steel Tire
and on Wagon Tire 3
inches thick.

Frasse & Co.,
AGENTS,
62 Chatham St., New York.
Importers of and Dealers in
Fine Tools,
Files, Steel Wire, &c.



THE JUDSON GOVERNOR.

It is a common method to advertise Governors without cost, unless satisfactory to the customer, and then charge High Prices for doing what any good Governor will do. Various Governors inferior to the "Judson" are sold in this way, operating well enough for three months, to insure collection of the pay, but becoming useless after a year's wear—their construction lacking durability. The Judson Governor is guaranteed to be not only the best Regulator of Steam Engines, but also the most durable Governor made. Parties in buying other Governors should stipulate that their durability be guaranteed, and should also take care that they do not for much inferior Governors, pay higher prices than those shown in the accompanying list. We guarantee the Judson Governor will do all any other Governor can do, and in Accuracy and Durability—the main essentials—we guarantee it shall do more.

Reduced Price List,

FEBRUARY 1, 1877.

For dimensions of Governor, see Illustrated Price List.



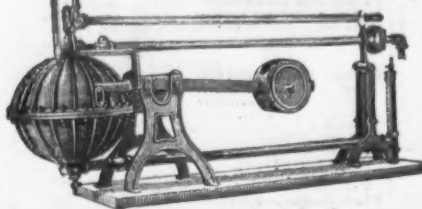
THE JUDSON PATENT Improved Steam Governor.

Size, Inch.	Plain.	Right Hand.	Left Hand.	Extra for Speed.	Stop Valve.
1 1/2	\$16.00	\$18.00	\$18.00	1.00	..
2	18.00	20.00	20.00	1.00	..
2 1/2	23.00	26.00	26.00	2.00	\$5.00
3	25.00	30.00	30.00	2.50	8.00
3 1/2	31.00	35.00	35.00	3.00	10.00
4	36.00	41.00	41.00	3.50	13.00
4 1/2	40.00	45.00	45.00	4.00	14.00
5	45.00	51.00	51.00	4.50	16.00
5 1/2	50.00	57.00	57.00	5.00	19.00
6	59.00	67.00	67.00	5.50	23.00
6 1/2	69.00	78.00	78.00	6.00	28.00
7	80.00	90.00	90.00	6.50	34.00
7 1/2	90.00	101.00	101.00	7.00	40.00
8	105.00	117.00	117.00	7.50	46.00
8 1/2	120.00	133.00	133.00	8.00	54.00
9	142.00	156.00	156.00	8.00	65.00
9 1/2	175.00	192.00	192.00	9.00	79.00
10	198.00	218.00	218.00	10.00	..
10 1/2	210.00	230.00	230.00	12.00	..

No Charge for Box and Carriage.

JUNIUS JUDSON & SON, Rochester, N. Y.

The Albany Steam Trap.



This Trap automatically drains the water of condensation from Heating Coils, and returns the same to the Boiler whether the Coils are above or below the water level in Boiler, thus doing away with pumps and other mechanical devices for such purposes. Apply to

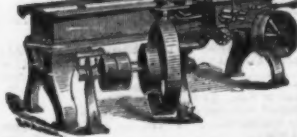
Albany Steam Trap Company, Albany, N. Y.

The Pratt & Whitney Co.,

Hartford, Conn.

Have constantly on hand and making

Drop Hammers



Of recently Improved Construction. Pony Trip Hammers, Blacksmiths' Sheaves, Broaching and Stamping Presses, Iron Shop Cranes, Machinists' Tools, Gun and Sewing Machine Machinery. Make to order Gray and Charcoal Iron Castings of all styles and sizes not exceeding 15 tons weight, (making patterns if desired). Furnish Clamp Pulleys of light patterns, cut gears in a superior manner, &c., &c.

Robt. Wetherill & Co

CHESTER, PA.

Corliss Engine

BUILDERS.

Shafting & Gearing.

Boiler Makers.

R. S. NEWBOLD & SON,

Eagle Works.

Norristown, Pa.

IMPROVED ROTARY SHEARS,

Rolling Mill, Blast Furnace, Flour Mill, Mining and Water Works Machinery, Air Compressors, Ore Washers and Brick Machines.

REFERENCES:

Rotary Shears for Plates and Circles.
A. Wood & Co., Conshohocken, Pa.
Ernst Stridberg, Sweden.
Lewis Daisel & Co., Pittsburgh, Pa.
H. A. Besie & Co., Parkersburg, Pa.
Rolling Mill & Blast Furnace Plants & Engines.
Merion Furnaces, Conshohocken, Pa.
Cora Furnace, Wrightsville, Pa.
Grove Spring Iron Works, New York.
Norristown Water Co.
Oliver & Co., Easton Sheet Mill.
Poststown Iron Co.'s Plate Mill.
Parkersburg Fine Mill.
Morris, Tinker & Co., Engines.
Durand & Marais' French Pat. Brick Machine.

For Brick Yards and Fire Brick Works, makes 10,000 superior bricks per day with two horse-power. In use at Brookville brick yards, Lynchburg, Va.; F. W. Kickbusch, Wausau, Wis.; Chettenham Fire Brick Works, St. Louis, Mo. Can hack bricks 12 high at once. The best, simplest and cheapest machine made.

THORNE, DeHAVEN & CO., Drilling Machines,

21st Street, above Market, Philadelphia.

PORTABLE DRILLS. Driven by power in any direction.
RADIAL DRILLS. Self-feed—Large Adjustable Box Table.
VERTICAL DRILLS. Self-feed.
MULTIPLE DRILLS. 2 to 20 Spindles.
HORIZONTAL BORING AND DRILLING MACHINES.
HAND DRILLS. CAR BOX DRILLS.
SPECIAL DRILLS. For Special Work.

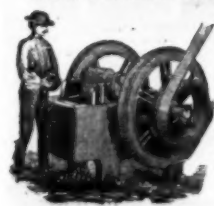
H. H. HARVEY'S HAMMER AND TOOL WORKS, Augusta, Me.



SPECIALTIES.—Stone Cutters' Hammers and Tools, Quarrymen's Drills, Wedges and Half Rounds, &c., &c., &c. Miners' Hammers and Tools, Blacksmiths' Hammers and Tools, Patent Hammer, for picking burr stone. Also the common Mill Picks and Wood wedges Steel or Iron, &c. Solid eye Picks, with one lb. of best cast steel inserted in each pick. The above goods are warranted inferior to none, both in quality and style of finish. All hammers have true eyes and polished faces, and are made from solid cast steel. No charge is made for boxing or crating at Augusta; shipping facilities are excellent. Hammers made to any pattern or drawing. Capacity of works, one ton of hammers per day. A full line of the above goods constantly in stock. Catalogue on application.

BLAKE'S PATENT STONE & ORE BREAKER.

New Pattern with Important Improvements & Abundant Strength



For reducing to fragments all kinds of hard and brittle substances, such as STONE for making the most perfect MACADAM ROADS, and for making the best CONCRETE. It breaks stone at trifling cost for BALLASTING RAILROADS. It is extensively in use in MINING operations, for crushing

IRON, COPPER, ZINC, SILVER, GOLD, and other ORES.

Also for crushing Quartz, Flint, Emery, Corundum, Feldspar, Gneiss, Barites, Magnesian, Phosphate Rock, Plaster, Soapstone, &c. For Illustrated Circulars, and particulars, address,

BLAKE CRUSHER CO., New Haven, Conn.

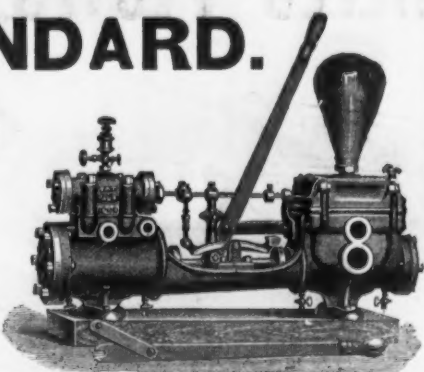
KNOWLES' THE STANDARD.

Knowles Steam Pump

Works,

92 & 94 Liberty St.,

NEW YORK.



The C. O. D. Engine

COSTS LESS

And is equal to any Engine in the market. ALL WORKING PARTS WELL FINISHED.

No. 1, Cylinder 4x6.....\$125.00
No. 2, " 5x7.....100.00

MANUFACTURED BY

J. AUSTIN & CO.,

115 Liberty St., New York.

Also, Proprietors and Manufacturers of Wheatcroft's Self-Adjusting Pipe Wrench,

AND SCRIPTURE'S FUNNEL TOP OILERS.



Keystone Pressure Blowers.

Anti-friction and noiseless; maximum blast and minimum power; all sizes for

Forges, Foundries, Rolling Mills, &c.

KEYSTONE EXHAUST BLOWERS.

Made on same principle,

For Ventilating Mines, Buildings, etc.; Removing Dust, Shavings, etc.; Drying Wool, Lumber, etc. Every Blower guaranteed. Send for circular, or call and see them in operation.

KEYSTONE PORTABLE FORGE CO.,

218 Carter Street, Philadelphia.

Also, sole manufacturers of the celebrated KEYSTONE PORTABLE FORGES, for all classes of work, from the lightest to the heaviest.



A. H. MERRIMAN,

Patent Power

Punching Presses.

Patentee and Sole Manufacturer.

I warrant every part of this Machine to stand the shock of the wheel running at 125 revolutions.

West Meriden, Conn.

Machinery Hall, Philadelphia, Section B 4, Columns 28 and 29.

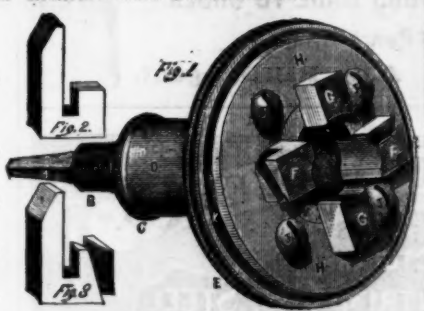
SILVER & DEMING MFG. CO.,

SALEM, OHIO, Manufacturers of

Improved TOOLS for the Use of Carriage and Wagon Makers and Blacksmiths.



Hub Boxing Machines,
Hollow Augers,
Spoke Tenoning Machines,
Blacksmith Drills,
Adjustable Clamps,
Water Tappers,
Irons.



Improved Blacksmith Drill.

Send for Price List.

Star Hollow Auger.

HAMMER & CO.,

Branford, Conn.

Manufacturers of the following Patented Articles of

MALLEABLE IRON:

Hammer's Adjustable Clamps.
Hammer's Malleable Iron Oilers.
Hammer's Mail Iron Hand Lamps.
Hammer's M. I. Hanging Lamps.

For Sale by all the principal Hardware Dealers.

Malleable Iron Castings

Of superior Quality and Hardware Specialties in Malleable Iron made to order.



SNYDER'S LITTLE GIANT STEAM ENGINE

The Best SMALL

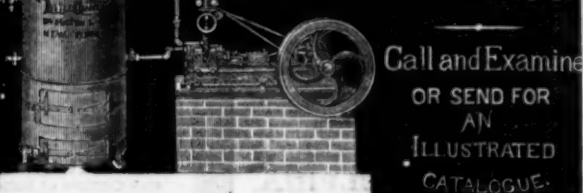
POWER ENGINES IN THE COUNTRY.

Manufactured by

WARD B. SNYDER,

94 Fulton St., NEW YORK.

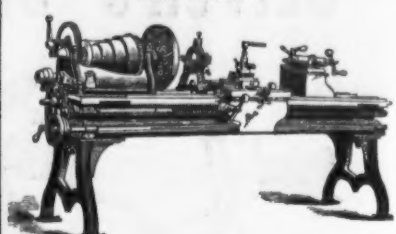
One-Horse Power, with tubular boiler complete, only...\$150.
Two-Horse Power.....200.
Three-Horse Power...250.



Call and Examine OR SEND FOR AN ILLUSTRATED CATALOGUE.

P. BLAISDELL & CO.

Manufacturers of



MACHINISTS' TOOLS,

Blaisdell's Patent Upright Drills,

With Quick Return Motion.

Engine Lathes, Planers, Boring Mills, Gear Cutters and Hand Lathes.

WORCESTER, MASS., U. S. A.



NORTHERN LIBERTY WORKS,

312 & 314 Greene St., Philadelphia, Pa.

ALFRED BOX & CO.,

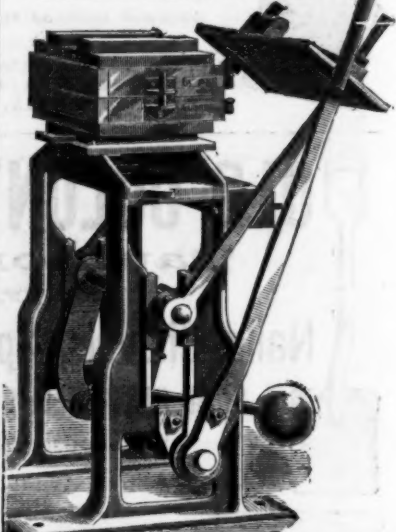
Manufacturers of Machinists' Tools, Pulleys, Shaftings and Hangers.

Patent Universal Radial Drills, Steam Hammers, Boiler Makers' Outlets.

MOLDING MACHINE.

Prices Reduced.

T. F. HAMMER'S PATENT.



Secure all advantages Molding Machines possess over hand molding; it is especially claimed for this machine that it requires no special flasks or boards but the same are used as for hand molding; it occupies no more room than a bench for hand molding; it produces at least cost more, smoother and uniform castings. Price list on application.

T. F. HAMMER,

Sole Manufacturer, Branford, Conn.

Malleable Iron Castings made to order.

Hoisting Engines

OF ANY POWER,

WITH

Improved Patent Friction Drums.

Adapted for Mines, Dock Building, Pile Driving, Quarries, &c.

J. S. MUNDY,

7 R. R. Ave., Newark, N. J.

Engine, Machinist & Blacksmith,

1656 Beach St. PHILADELPHIA.

Drawings made to order. Repairing of all kinds promptly attended to. Blacksmithing executed in all its branches.

CHAS. FORSCHNER,

Manufactures of Butchers' Tools, Machinery, and Excelsior Upright Sausage Stuffers.

(Forschner's Patent.)

41 Livingston St., bet. Forsyth and E. 4th St., N. Y. Send for illustrated Price List with Specified Dimensions.

MINERS' CANDLES.

superior to any other Light for Mining Purposes. Manufactured by

JAMES BOYD'S SON,

Nos. 10 & 12 Franklin St., N. Y.

Machinery, &c.

THE Shapley Engine

Patented Feb. 10, 1874.

COMPACT,
PRACTICAL,
DURABLE,
ECONOMICAL.
\$200.00.

Cheaper than any Engine offered of the same capacity.

MANUFACTURED BY

SHAPLEY & WELLS
Binghamton Iron Works,
Binghamton, N. Y.

Manufacturers of Steam Engines, Boilers, Water Wheels, Circular Saw Mills and Mill Work generally.



BUSH HILL IRON WORKS,

Corner 16th & Buttonwood Streets
PHILADELPHIA.

JAMES MOORE,

(Successor to MATTHEWS & MOORE,)

Engineer, Machinist, Founder and Boilermaker.

CASTINGS of every description.

ROLLING MILL AND FURNACE EQUIPMENTS COMPLETE

Rolls Turned for Rails, Beams, Angles, and all shapes for Iron, Steel, or Composition Metals.

Sugar Mill, Saw Mill and Grist Mill Machinery,
AND MILLWRIGHTING IN GENERAL.

BOILERS—FLUE, TUBULAR AND CYLINDER, and all kinds of
TANK AND PLATE IRON WORK.

Chas. W. Ervien & Co.,
IRELAND ST.
Kensington, PHILAD'A
BUILDERS OF
STATIONARY & MARINE
ENGINES, BOILERS
SHAFTING, GEARING,
AND
MILL WORK
GENERALLY.
Special Machinery
BUILT TO ORDER.

Vertical
AND
Horizontal
Engines,
Of New and Heavy Designs, from 2 to 100 H. P.,
on hand or in process of erection.

THE HASKINS ENGINE.
Combined with Boiler, like cut, to 12 H. P.; independent, to 100 H. P.
OUR GUARANTEE.
Ten (10) per cent. less fuel than the best. Thirty (30) to fifty (50) per cent. less than the so-called cheap. Fifteen (15) per cent. greater power, size for size. Far greater durability and extreme simplicity, and all this based on the simple rules of design and method of manufacture.
NOTE.—Forged Steel Piston Rods, Valve Rods, Connecting Rods, Crank Shafts and all Pins. Best No. 1 Babbits and box metal Boxes, and only the very best stock in Engines or Boilers. Low prices based on rapid duplication by standard gauges.
IN USE ALL OVER THE WORLD.
All Boilers insured by the Hartford Boiler Insurance Co. free.
The Best is the Cheapest.
Fitchburg Steam Engine Co.,
FITCHBURG, MASS., U. S. A.
In sending for pamphlet, please say where you saw this.

RICHARD DUDGEON,
No. 24 Columbia Street, New York,
MAKER AND PATENTEE OF
Hydraulic Jacks and Punches,
ROLLER TUBE EXPANDERS
And Direct-Acting Steam Hammers.
Communications by letter will receive prompt attention.
JACKS for Pressing on Car Wheels or CRANK PINS made to order

Machinery, &c.

Established 1848.

WM. SELLERS & CO.,

600 Hamilton Street, PHILADELPHIA.,

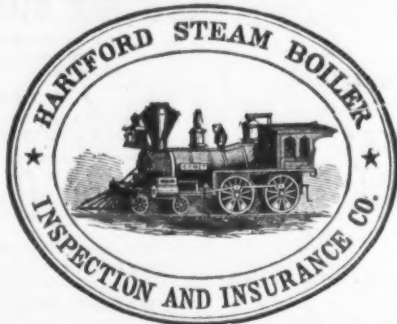
Engineers, Iron Founders and Machinists.
RAILWAY SHOP EQUIPMENTS.

Our Steam Hammers, Lathes, Planers, Drills and Bolt Cutters
Are of Improved and Patented Construction.

Railway Turning and Transfer Tables,
SHAFTING & MILL GEARING, a specialty.

Pivot Bridges.

GIFFARD'S INJECTOR—IMPROVED, SELF-ADJUSTING.



Issues Policies of Insurance after a careful inspection of the Boilers

COVERING ALL LOSS OR DAMAGE TO

Boilers, Buildings and Machinery,

ARISING FROM

STEAM BOILER EXPLOSIONS.

The Business of the Company includes all kinds of STEAM BOILERS

Full information concerning the plan of the Company's operations can be obtained at the

COMPANY'S OFFICE, HARTFORD, CONN.,

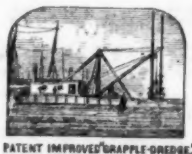
or at any Agency.

J. M. ALLEN, Pres. W. B. FRANKLIN, Vice-Pres. J. B. PIERCE, Sec.

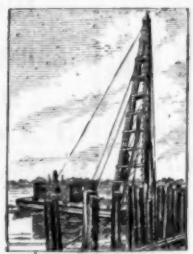
Board of Directors:

J. M. ALLEN, President.
LUCIUS J. HENDEE, Pres't Aetna Fire Ins. Co.
FRANK W. CHENEY, Asst. Treas. Cheney Brothers Silk Manufacturing Co.
CHARLES M. BEACH, of Beach & Co.
DANIEL PHILLIPS, of Adams Express Co.
GEO. M. BARTHOLOMEW, Pres't Amer. Nat'l Bank.
RICHARD W. H. JARVIS, Pres't Colt's Fire Arms Manufacturing Co.
THOMAS O. ENDERS, Sec. Aetna Life Ins. Co.
LAVERETT BRAINARD, of Case, Lockwood & Brainard.
GEN. WM. B. FRANKLIN, Vice Pres't Colt's Pat. Fire Arms Mfg. Co.
AUSTIN DUNHAM, Pres't Waltham Loom Co.
GEO. CROMPTON, Crompton Loom Works, Worcester, Philadelphia.
WILLIAM ADAMSON, of Bieder, Adamson & Co., Philadelphia.
WM. B. BEMENT, of Wm. B. Bement & Co., Phila.
HON. THOS. TALBOT, Ex-Governor of Mass.
NEWTON C. CASE, Case, Lockwood & Brainard, Hartford.
WILLIAM S. SLATER, Cotton Manufacturer, Providence, R. I.

THE AMERICAN DREDGING CO.



PATENT IMPROVED GRAPPLE-DREDGE.



SEAM & PILE-DRIVER POWER PILE-DRIER.



IMPROVED TRIPPER DREDGE.

BUILDERS OF STEAM DREDGING MACHINES,
GUNPOWDER PILE-DRIVERS, &c.

CONTRACTORS FOR

IMPROVING RIVERS AND HARBORS,
EXCAVATING CANALS,
RECLAIMING AND FILLING LOW LANDS,
PILING FOR FOUNDATIONS, PIERS, Etc.

Offices, No. 10 South Delaware Ave., Philad'a.

JOHN S. HUNTER, President. EDWARD J. MURPHY, Sec. & Treas.
The Hartford Foundry & Machine Co.,
Successors to the WOODRUFF & BEACH IRON WORKS,
MANUFACTURERS OF

Marine & Stationary Engines, Mill Gearing
Hoisting and Mining Machinery.

PUMPING ENGINES, for City and Town Supply a Specialty.
80 to 96 Commerce Street, HARTFORD, CONN.

C. A. & W. L. TEAL,
Manufacturers of IMPROVED BENDING ROLLS

Arranged for Removing Work from the end of ton roll.

COMBINED

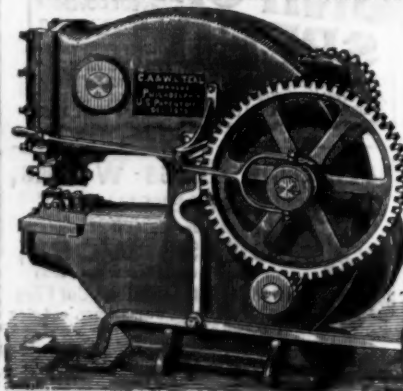
Punching & Shearing Machines,
With "Automatic Stop motion,"
Adjustable to any point of the stroke.

Single Power Punching Machines,
With Shearing Attachments.

Steam Riveting Machines,
Boiler Makers' and Machinists' Port
Drilling Machines, Hair Pick-
ing & Cleaning Machines, and

MACHINERY
in general.

4116 Ludlow St., Philadelphia.



Machinery, &c.

DROP HAMMERS.

The Best in Use.
THE STILES & PARKER PRESS CO., Middletown, Conn.

HYDRAULIC JACKS

AND

PUNCHES

For
Raising Heavy Weights
Punching Iron, Etc.

HYDRAULIC PRESSES

On hand and made to order.

Second-Hand Hydraulic Presses
Bought and Sold.

Machinery for Polishing and
Buffing Metals.

Send for Circular.

E. LYON & CO.,
470 Grand St., N.

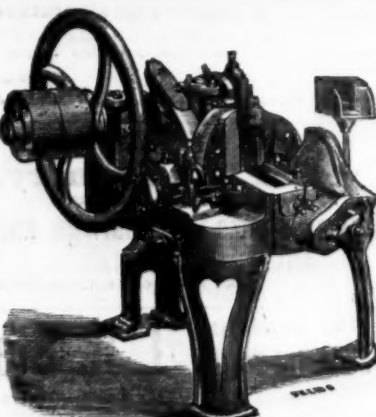


RIVAL
STEAM
PUMPS
CHEAPEST
AND THE
BEST
FOR
HOT & COLD
WATER.
\$45.00
UPWARDS.

15 SIZES
MANUFACTURED BY
JOHN H. MCGOWAN & CO.
CINCINNATI

BUCKET PLUNGER

VALLEY MACHINE CO.
EAST HAMPTON MASS.
STEAM PUMP



PITTSBURGH MFG. CO.,
Manufacturers of Nail and Spike Machines, Patent
Bolt Heading Machines, Screw Cutters and Tappers,
Bolts, Nuts, Washers, Rivets, &c. Castings, For-
gings and Blacksmith Work promptly attended to.
Office & Works, Railroad St., near 10th, Pittsburgh

TUBAL SMELTING WORKS,

760 South Broad Street, PHILADELPHIA.
PAUL S. REEVES,
MANUFACTURER OF

ANTI-FRICTION METALS.

XXX Genuine.....	55c	C.....	17c
XX.....	35c	D.....	14c
X.....	30c	E.....	12c
A.....	25c	F.....	10c
B.....	20c		

"Note."—The above are my standard mixtures, and have given satisfaction wherever used, but I am prepared to make Anti-Friction Metal of any quality or mixture desired by the purchaser.

INGOT BRASS. OLD METALS AND TURNINGS WANTED. BRASS CASTINGS.
ESTABLISHED 1842.

WM. & HARVEY ROWLAND

PHILADELPHIA,

P. O. Address: Frankford, Philad'a. MANUFACTURERS OF ALL KINDS OF

Elliptic, Platform AND C Springs,

MADE EXCLUSIVELY FROM
SWEDISH STOCK, OIL-TEMPERED and WARRANTED.

Swedish Tire, Toe, Blister and Spring Steel.

CAST SPRING AND PLOW STEEL.
CAST SHOVEL, HOE AND MACHINERY STEEL.

OXFORD TOE, SLEIGH, TIRE AND SPRING STEEL.
BESSEMER SHOVEL AND PLOW STEEL.
BESSEMER MACHINERY AND CULTIVATOR STEEL.

RE-ROLLED NORWAY SHAPES.
NORWAY NAIL RODS ROLLED AND SLIT FROM SUPERIOR BRANDS.
D. ARTHUR BROWN & CO., Fisherville, N. H.



DERBY SILVER CO., Derby, Conn.



Most Reliable Plated Spoons and Forks. 90 per cent. more silver than usual standard. Highest Honor Awarded Centennial Exhibition, Prize Medal and Diploma. Send for illustrated catalogue.

Iron Clad Mfg. Co.,

50 Greenpoint Ave., BROOKLYN, E. D., N. Y.
P. O. Box 3228 N. Y. City.



The Best and Cheapest Shovel in the World.

J. S. PROUTY, Pres. A. H. GOSS, Sec'y and Treas.
Prouty Hardware and Manufacturing Co.,
Wholesale dealers in
FOREIGN & DOMESTIC HARDWARE, &c., &c.
Agents for Amwake's Scandinavian or Jail Locks.
A large lot of Birmingham Shovels at job prices.
Agents for ERIE LAWN MOWERS.
No. 53 Beekman Street, New York.

THE CONNECTICUT VALLEY MFG. CO.,
CENTERBROOK, CONN., Manufacturers of
Lewis' Patent Single Twist Spur Bits,



Send for our illustrated price list and discounts.

JOB T. PUGH'S

Celebrated AUGERS and BITS.

WARRANTED SUPERIOR TO ANY OTHER MAKE.
They are made entirely by hand, and are especially adapted to hard wood. Supplied to the trade only. Gas Fitters, Millwrights, and Carpenters' Augers and Bits. Machine Bits of all descriptions made at short notice.

Office and Works,
Rear of Nos. 3112, 3114, 3116, 3118 & 3120 Market Street, Philadelphia, Pa.

E. O. WILLIAMS & SON,
Brass & Bell Foundry,
Jersey City, N. J., Manufacturers of
Refined Bronze Car Bearings and
Anti-Friction Metals.

No. 1, 30c; No. 2, 25c; No. 3, 20c; No. 4, 15c; No. 5, 10c; No. 6, 8c.

The Reading Bolt & Nut Works. J. H. Sternbergh, Pa., U. S. A.

MACHINE BOLTS, HOT PRESSED NUTS,
Railroad Track Bolts, Boiler and Bridge Rivets, Bolt Ends, Washers, Wood
Screws, Turnbuckles, Refined Bar Iron, Etc., Etc., Etc.

STANLEY G. FLAGG & CO.
PHILADELPHIA, PA.
Office and Warehouse,
No. 216 & 218 N. THIRD ST.

STEEL CASTINGS.

A Substitute for Steel and Wrought Forgings.
Circulars sent on application.

Steel Castings

We make Steel Castings true to pattern, sound and strong. Can be worked same as bar steel. Plowshares, Mold-boards and Land-sides, Anthracite Coal-breaker Teeth, Wheels and Pinions, Dies and Hammer Heads, Engine and Machinery Castings of all descriptions, Railroad Frogs and Crossings. Invaluable for all articles requiring great strength and durability.
Send for Circular.

PITTSBURGH STEEL CASTING CO.,
PITTSBURGH, PA.

Crucible Steel Castings

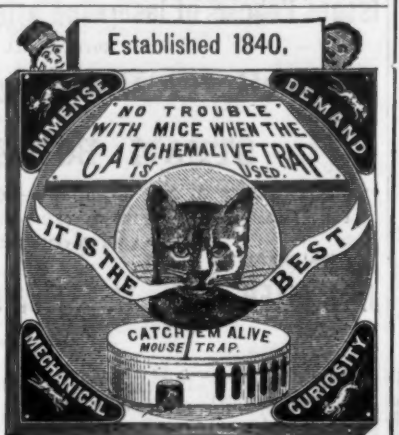
Light and Heavy STEEL CASTINGS of superior quality made on short notice, true to pattern, solid, strong and durable, can be readily forged and tempered.

J. C. BIDWELL,
Pittsburgh Plow and Crucible Steel Casting Works,
PITTSBURGH, PA.

Steel Castings,

Solid and Homogeneous. An invaluable substitute for expensive forgings, or for Cast Iron requiring great strength. Send for circular and price list to

CHESTER STEEL CASTINGS CO.,
Evelina St., Philadelphia, Pa.



R. E. DIETZ,
54 & 56 Fulton St., N. Y.

Manufacturer of
TUBULAR LANTERNS,
"Catch-em-Alive" Mouse Traps,
BRASS and IRON
JACK CHAINS.

Machines AND Wheels
Guaranteed
LEHIGH VALLEY EMERY WHEEL CO.
Send for Illustrated Circular. Weissport, Pa.

SLIGO IRON MILLS

Established 1825.
PHILLIPS, NIMICK & CO.

The only Manufacturers of
"Sligo" Fire Box Iron, Boiler Plate, Sheet and Bar Iron,

AND
"Tyron" Brand of Bar, Tank & Sheet Iron, Girder and Ship Plates, Angle and Horse Shoe Iron, &c., &c.

Plates Rolled 100 inches wide.
OFFICE AND MILLS,
South Side, Pittsburgh, Pa.

Sligo Stay Bolt Iron, Warranted Unexcelled.
BOILER HEADS & FLUE HOLES
FLANGED TO ORDER.

Quality our Specialty.



Scranton Brass Works,

J. M. EVERHART,
Manufacturer of
BRASS WORK,
For Water, Gas & Steam. Also
Car & Wilcox Patent Cut Files.
Will cut faster, wear longer, and clog less than any file in market.

418 Street, SCRANTON, PA.

12 REASONS WHY Du Plaine & Co.'s Anti-Friction Metals SHOULD BE USED.

First.—Because they approach more nearly to what is required of a perfect Anti-Friction Metal.
Second.—Because they have been tested thoroughly by the best mechanics and this fact established.
Third.—Because they are made of refined and new metals, and not produced from drosses resmelted.
Fourth.—Because, being porous in their nature, they hold the oil necessary for proper lubrication.
Fifth.—Because they are hard enough to insure a polished surface to the moving parts, and not destroy or heat the journal.
Sixth.—Because they are free flowing, and if properly melted contain no dross.
Seventh.—Because by reducing the friction they increase the useful effects.
Eighth.—Because they are cheap and economical, reducing the expenditure of oil, coal, time, labor and wear of machinery.
Ninth.—Because the best mechanics use them.
Tenth.—Because, from long and extended experience as engineers and metallurgists, we try to produce the best metals that will give the best practical results, and we believe we have succeeded.
Eleventh.—Because we warrant our metals.
Twelfth.—Because we are open for competition from any respectable manufacturer of Anti-Friction Metals who can produce a better metal, a more reliable metal, and a cheaper metal than we make, and invite the test anywhere.

DU PLAINE & CO., Philadelphia.

Russell, Burdsall & Ward,

PORT CHESTER, N. Y.

Manufacturers of
Carriage, Tire, Plow, Stove,
AND OTHER

BOLTS.

Carriage Bolts made from Best Square Iron, a Specialty.

JOHN RUSSELL CUTLERY CO.,

Green River Works,
MANUFACTURERS OF

Table and Pocket Cutlery,
BUTCHERS', HUNTERS', PAINTERS', DRUGGISTS' & HOUSEHOLD KNIVES
IN ALL STYLES AND VARIETIES.

Highest Centennial Award.
Two Medals and Diploma of Highest Merit. First Home Manufacturers.

New York Office,
97 Chambers
and 79 Reade Streets.



Factories,
Turners Falls, Mass.

DOOR SPRINGS.

"TORREY" Rod Springs,

"GRAY'S" Rod Springs,

"GEM" Coil Springs,

"STAR" Coil Springs.

☞ All of the BEST CAST STEEL

(not Bessemer) and at the

LOWEST MARKET PRICES.

Van Wagoner & Williams,

MANUFACTURERS,

82 Beekman Street, NEW YORK.